

***Leunca* (*Solanum americanum* Mill.): The uses as vegetable in two villages in Upper Citarum Area, Bandung, West Java, Indonesia**

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Abstract. Mulyanto D, Iskandar J, Abdoellah OS, Iskandar BS, Riawanti S, Partasasmita R. 2018. *Leunca* (*Solanum americanum* Mill.): The uses as vegetable in two villages in Upper Citarum Area, Bandung, West Java, Indonesia. *Biodiversitas* 19: 1941-1954. *Leunca* is known as botanical name as *Solanum americanum* Mill, Family of Solanaceae. In recent years, academic interest has been increasing. After so long studied as weeds, today *leunca* has also studied because of its important meaning as crop that has high nutritional and economic value in relation to food resilience of developing countries, as because of its chemical substances with its medicinal properties. *Leunca* was recorded in colonial period by botanists or agricultural scientists' report as local vegetable in rural of West Java also in modern time by anthropologist or ecologists who studying rural population. In the recent time in Indonesia, *leunca* studies almost all have been focused on its pharmacological, agronomic, and economic aspects. The aspect that is related to Sundanese sociocultural system was almost neglected. This paper presents the finding of research on ethnobotany of *leunca* includes landraces, agronomical and utilization, traditional institutional aspect, and culinary culture food habits of *leunca* in rural Sundanese people. Method used in this study mixed-method of qualitative and quantitative was applied in this study, while some techniques including observation and semi-structured interviews were carried in the field research. The result of study showed that based on informants it has revealed that 7 kinds of plant that are named as *leunca*, however, only 3 kinds of *leunca* that are grown in their village. Among 7 kinds of *leunca*, *leunca biasa* (*S. americanum*) has been predominantly consumed both fruits and leaves. There is various food dishes are consumed fresh or cooked. Various dishes of *leunca biasa* have been culturally integrated everyday life of people and culturally as part of people identity of Sundanese people (*urang Sunda*). Other kinds of *leunca*, including leaves of *leunca manuk* (variety of *S. americanum*) have been consumed *leunca* as cooked vegetable, and its leaves have been used as traditional medicine of pet chicken disease.

Keywords: Ethnobotany, habitus, *leunca*, vegetable, socio-cultural identity, *Solanum americanum*

INTRODUCTION

Leunca is included into species complex of *Solanum americanum* Mill, family of Solanaceae (Siemonsa and Grubben 1996; Edmond and Chweya 1997; Samuel 2015). In recent years, there have been increasing academic interest to *leunca*. After so long studied as weeds, now *leunca* also has been studied because of its important meaning as a crop that has high nutritional vegetable of Sundanese people in relation to food resilience issue in developing countries, and because of its chemical substances with its medicinal properties (Sarma and Sarma 2011).

In West Java, research on *leunca* was initiated by Fortuin and Omta (1980) who at the end of 1970 studying *leunca* in Lembang, Bandung, West Java, concerning *leunca* photosynthetic characteristics as function of light intensity. Their choice on Lembang, Bandung, West Java as site of research was related to the fact that although *leunca* also grows in other places in Indonesia (see Silalahi and Nisyawati 2018), but this plant has predominantly consumed as fresh as vegetable and hot shrimp/fish paste (sambel), planted in homegarden, and commonly traded in

traditional market of Bandung (see Iskandar et al 2018). In the past, it was revealed that *leunca* was an integral part of rural West Java's picture of biodiversity. In the description of rural life in the colonial period, Dutch scholar almost always mentioned that *leunca* was local vegetable that is cultivated and consumed by 'Soendalanden' or 'Preanger' rural population. In his article published in 1845, in famous Dutch botanist, Justus Karel Hasskarl, mention *leuntja* as: a crop that belongs to Family Solanaceae, just like a plant, which is used mainly in the Sunda region as a snack, both raw and cooked or steamed, is named as the *leuntja*. It is scarcely planted on rice field (*sawah*), more on tile grounds and to small expanses. The land requires little processing. When plants have ripened, as seen many ripe fruits, they can be harvested. Then the plants are pulled out of the soil, the roots are cut off and bind together to bunches. While the fruit is enjoyed as *terong*, the leaves and young stem parts of *leuntja* are used. Mainly it is mixed with fish, *leuntja* is eaten (Hasskarl 1845).

Another agronomist, van der Burg (1904) also documented the presence and utility of *leunca* in rural of West Java, as mentioned as follow: "The raw leaves are usually eaten and the whole plant is boiled, the fruits which

are the fresh fruits, sometimes raw, but mostly cooked, and mixed with meat, especially lamb and fish, for the European table. They are also mixed with minced meat and then fried. Tomato jelly is also made from this fruit. The leaves and the young sprouts are cooked in steam, eaten as vegetables".

Contemporary rural studies in West Java also mentions that *leunca* as local vegetable that was planted whether in home garden (Maten and Abdoellah 1988) or both in home garden and dry land agroforest (Abdoellah and Marten 1986; Soemarwoto 1987), in wet rice paddy field's dike or in agroforestry land (Wiyanti 2016). In some rural area of West Java some places, *leunca* is also cultivated semi-intensively as crop to supply local market (Santosa et al. 2015).

Related to role played by *leunca* in consumption pattern of rural peasant in upland West Java, special intensive case study on food ecology, carried out micro study by Igarashi (1985) in a village of Cigentur, Paseh sub-district, Bandung plain of upper Citarum, also found that from 35 types of food that was regularly consumed by villagers in a month, *lalab leunca* ranked in 16th place, the highest rank among *lalaban* vegetables category, surmounting "*seupan daun sampeu* (*Manihot esculenta* Crantz), *selong* (*Leucaena leucocephala* (Lam) de With, *peuteuy* (*Parkia speciose* Hassk), "*terong* (*Solanum melongena* Linn), or *kangkung* (*Ipomoea aquatic* Forsk). As *angeun leunca* or soup of *leunca*, its rank also recorded in the third place (Igarashi 1985).

Similar picture was also found by Abdoellah (1985). In his study on food ecology in same village as undertaken by Igarashi, Cigentur Village, in Upper Citarum revealed that according to its presence frequency as a part of daily menu during a month observation, *leunca* appeared as much as 66.7% in rich peasant family's menu list, 63.3% in middle peasant family, and 36.7% in poor family's daily menu list. That is to say that in middle to upper class, *leunca* almost always presence in more than half of daily menu list during a month.

In addition to description of *leunca* appearance in West Java rural everyday life, the record from colonial period and contemporary micro studies also emphasize *leunca* local character in production and consumption. That is true that until recently, together with other vegetables with limited market niche, *leunca* is categorized as minor or underutilized (Soetiarso 2010b), indigenous (Putrasamedja 2005), or local vegetables (Susanti 2015): plants that have been adapted to or fully expressed in certain area and utilized from generation to generation by local people with relatively limited market niche from broader context.

In the last decade, researches on *leunca* in Indonesia, have mainly focused on its three aspects, mainly pharmacological (Rumiyati et al. 2015; Istiadji 2010), agronomical (Santosa et al. 2015), economical (Soetiarso 2010b; Yurlisa 2016), and its medicinal utilization aspect by local people (Putri et al. 2016). Although *leunca* is mentioned earlier as one of important vegetable crops in some villages of Bandung, West Java, research on ethnobotany of *leunca* as vegetable has rarely carried out in rural areas of West Java.

MATERIALS AND METHODS

Study area

The field research was conducted in two villages, namely Sukapura Village and Tarumajaya Village of upper Citarum, Kertasari Sub-district, Bandung District, West Java, Indonesia (Figure 1). Two villages of upper Citarum were selected for case study on ethnobotany of *leunca*, because based on ecological history, in the past both villages were known as traditional village, with several traditional agroforestry systems, including homegarden, perennial mixed-garden, and bamboo garden, were predominantly found. Nowadays, however, due to introduction of commercial crops, such as cabbage, potato, and spring onion, some homegardens, perennial mixed gardens, and bamboo gardens have been converted to commercial monoculture gardens. As a result, ecological aspects of agroecosystems and socio-cultural aspects of rural people in both villages, Sukapuran and Tarumajaya have dramatic changes. Based on study on ethnobotany revealed that modernization of agricultural system and consumption changes of rural people have caused changes of traditional diversity of plants (Brush 2000; Iskandar, Iskandar and Partasmita 2018). Both villages Sukapura and Tarumajaya were predominantly resided by Sundanese people. Therefore, these villages have considered as ethnobotany on *leunca* in rural areas of West Java.

Sukapura and Tarumajaya villages are located in the high land with have topography of slopes or ridges of hills in the vicinity of Mount Wayang. The total is of Sukapura and Tarumajaya recorded approximately 633 ha and 2,744 ha, respectively. Both Sukapura and Tarumajaya villages are located in 1,200 m above sea level, which have daily temperature 17-22°C.

Based on environmental history, Sukapura and Tarumajaya were formed first half of the twentieth century. Since the decade of 1960s, both villages have been recorded as the villages of network of the Kertasari-Pangalengan complex, which is recognized as vegetable agricultural center production. Some vegetable crops have been predominantly recorded, including potato (*Solanum tuberosum* L), carrot (*Daucus carota* L), spring onion (*Allium fistulosum* L), and cabbage (*Brassica oleracea* var. *capitata* L.). In terms of land use type, the dry land has been predominantly found in Tarumajaya Village, which has 2,145 ha of the agricultural land use types, including vegetable garden, coffee garden, and community forest. Unlike Tarumajaya Village, Sukapura Village which is located more below, recorded not extensive the rice field of 15 ha planted by rice, and other land use types namely home garden and vegetable garden (Figure 2). In addition, approximately 199 ha of Sukapura Village have been predominantly used for agricultural land, and approximately 423 ha have been used for non-agricultural sectors, including market, shops, and small-scale industries. *Leunca* has commonly in homegarden and garden in mixed-cropping system other crops instead of commercial monoculture system as predominantly practiced in present time.

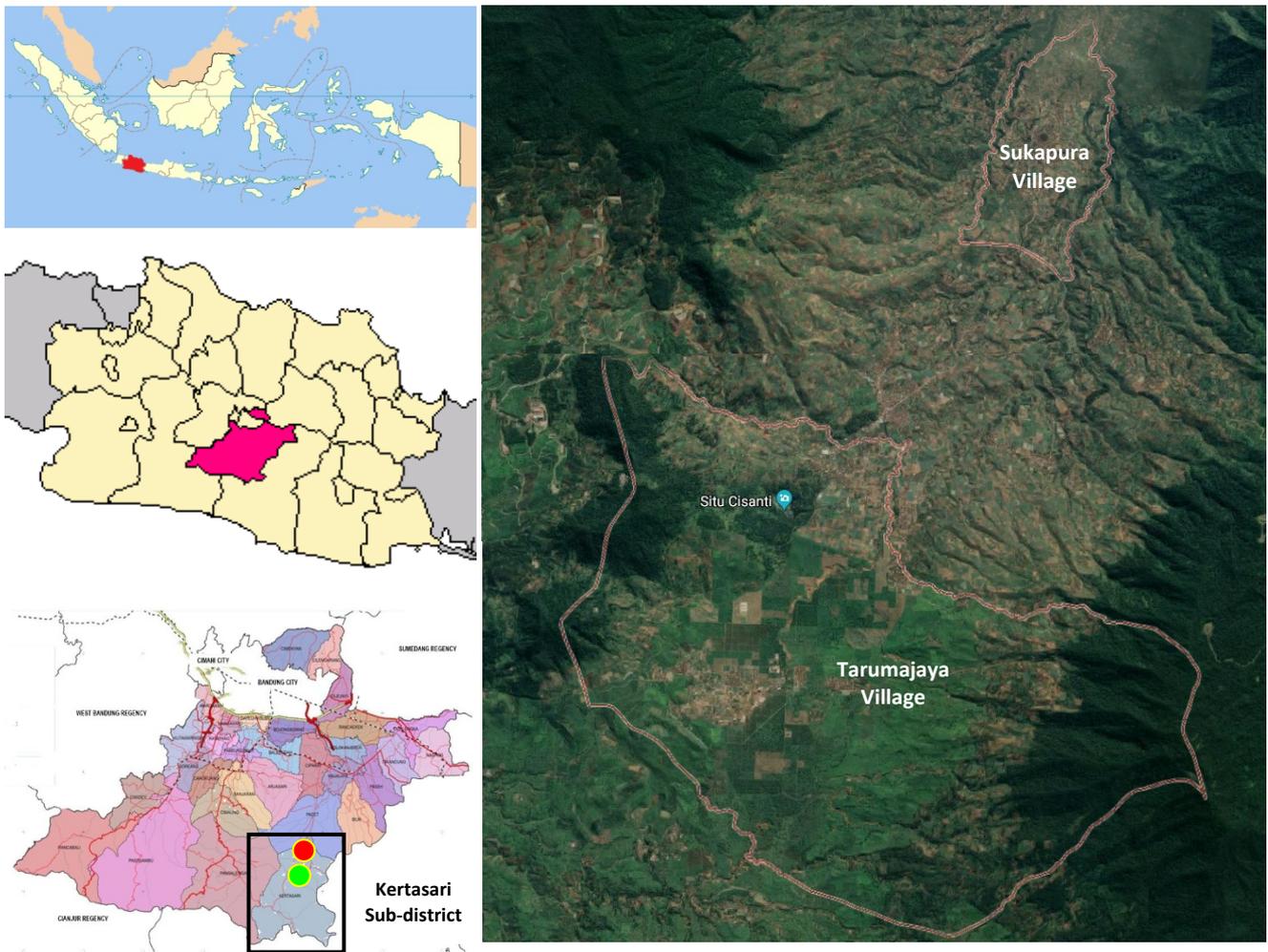


Figure 1. Study area of Sukapura Village (●) and Tarumajaya Village (●), Kertasari sub-district, Bandung district of upper Citarum, West Java, Indonesia



Figure 2.A. Land use types consist of vegetable garden, homegarden, and forest in the study area of Tarumajaya Village, upper Citarum, West Java, Indonesia. B. The rice field and vegetable garden in the study area of Sukapura Village, upper Citarum, West Java, Indonesia

Based on village statistical data, in 2007 population of Sukapura Village was recorded 8,900 people belonging to 3,297 households, consisting of 3,297 neighborhoods (RT). While, Tarumajaya Village was resided by at least 15,000 people consisting of 2,623 households, among them 34% of population of Sukapura were recorded as classified as productive age. The proportion of productive age in Tarumajaya Village was recorded approximately 70%. Most of the productive age of people in both villages Tarumajaya and Sukapura have been involved in the agricultural sector. Vegetable productions of those villages have been predominantly recoded namely *bawang daun*/spring onion (*A. fistulosum*), *tomat*/tomato (*Lycopersicon esculentum* Mill), *sawi*/Indian mustard (*Brassica juncea* (L) Czern & Coss), *kentang*/potato (*S. tuberosum*), and *kubis* or *koll*/cabbage (*B. oleracea* var. *capitata*). Because Tarumajaya Village is located in higher land of the high land, since the Dutch colonial period, some areas of Tarumajaya Village has been established as plantation areas, including tea/teh (*Camelia sinensis* L) and quinine/kina plantation (*Chincona* sp.) (Kurniawan et al. 2018). After the Dutch colonial period, the tea plantation has been managed by PT Perkebunan Nusantara VIII. While some areas of Sukapura have, it has directly bordered with the forest that has been managed by PT Perhutani. In addition to involve in vegetable garden, small scale of dairy farm has been undertaken by farmers of both Tarumajaya and Sukapura villages.

People of Tarumajaya and Sukapura have been considered as Sundanese people (*Urang Sunda*). It has been also recorded in Sukapura Village non-Sundanese people. For example, some Javanese families wander and have wives, and live in the research village. They communicate with each other use local language, Sundanese language (*Bahasa Sunda*). Family families who were born and their ancestors all lived in the village and still follow various customs that apply to the Sundanese people (see Ekadjati 1995; Mustapa 1996).

Procedure

Method used in this study was mixed-method that is dominant qualitative and less dominant quantitative, with ethnobotanical approach (Cresswell 1994; Martin 1995; Alexiades and Sheldon 1996; Cotton 1996; Cunningham 2001; Iskandar 2018). Several techniques, namely observation and semi-structured interview were applied in this study. Observation was done to carefully observe various *leunca* variations which are cultivated and are grown in different agroecosystem types, including homegarden, garden, and rice field, and widely grown as weeds in the dry land and forest. The observations in the field were accompanied by informants of rural people in the study area. If we have found certain *leunca* variation in natural habitats and man-made ecosystems of the study area, it was discussed with informants on various aspects of local knowledge or traditional ecological on *leunca*, including local names, distinctive characteristics, folk classifications, ecology, agronomy, and utilization. Moreover, *leunca* variations were taken of pictures and specimens or herbariums were also collected to analyze in the Ethnobiological Laboratory

of the Department of Anthropology and the Department of Biology, Universitas Padjadjaran, Sumedang, West Java, Indonesia. Observation was also undertaken on sales and consumption of *leunca*. The aim of the observation of *leunca* was to get more detail information of its morphological structure and utilization of *leunca* among rural people and also selling *leunca* that was carried out in the Sundanese rural small restaurants (*warung*) and traditional markets in both in rural areas and urban areas. Some literature of plants, particularly vegetables, including Burkill (1935), Backer and Bakhuizen (1968); Heyne (1987); and Siemonsa and Grubben (1996) were also used to analyze botanical characteristics of *leunca* variations.

The semi-structured interview or deep interview was undertaken with competent informants, including informal leaders, village formal leaders, village small shop traders and vendor traders of traditional markets to obtain detail local knowledge on *leunca*. Each individual informant gives expensive to a series of general questions on variations, folk classification, botanical characteristic, ecology, agronomy, and utilization of *leunca*, some of which have been prepared in advance and some of which arise naturally during the course of the conversation. While structure interview, it was undertaken with 80 respondents of both village that is randomly selected of Sundanese households. Each respondent was interviewed by using questionnaire. Each respondent was asked with the same set questions, such as various side dishes of vegetables were consumed in breakfast, lunch, and dinner.

Data analysis

Various qualitative data obtained from the deep interviews with informants and direct observation of researchers during field research were analyzed by cross-checking with triangulation techniques, namely validation of databased information from different informants, and crosschecking data obtained from interview results and personal observation of researchers in the field, including conducting data validation with photo documented. All information was summarized, synthesized, and narrated with descriptive analysis and evaluative (cf. Martin 1991; Newing et al. 2011; Iskandar 2018). To analysis quantitative data obtained by questionnaire, interview was calculated by simple statistical analysis mainly percentage of answers (%) = $(n / N) \times 100\%$, where n= number of respondents who choose a particular answer, and N= total number of respondent's answers, moreover make narration of descriptive analysis. □

RESULTS AND DISCUSSION

Botanical and ecological knowledge

Based on deep interview it has been revealed that all informants knew on plant of *leunca*. However, concerning detail local knowledge of plant of *leunca*, is not the same. In general old informants (age more than 70 years) know more variations of *leunca* or various kinds of plant named *leunca* compared to that of young informants (age of 17-70 years) All elderly informants at least know six variations of

leunca, namely: *leunca komir*, *leunca bonglot*, *leunca beureum*, *leunca monyet*, *leunca badak*, *leunca manuk*, *leunca hayam*, and *leunca biasa* (Table 1; Figure 3). Unlike elderly informants, young informants, in general, know only three variations or kinds of plant named *leunca*, namely *leunca manuk*, *leunca hayam*, and *leunca biasa* instead of 6 variations or kinds. This result is similar to that of undertaken by other scholars that local knowledge of community varies greatly person to person due to factors such as age, subsistence practice, gender, and bilingualism. Generally, people older have more knowledge than younger people (Lizarralde 2004).

Empirically, based on personal direct survey or observation in the field, it has been revealed that only 3 variations (landraces) or kinds plant named *leunca* in two villages of the study area. Landrace can be defined as local category for grouping cultivated plants, in this case, *leunca* according to common characteristics reflected in specific vernacular name (Iskandar and Ellen 1999). Kind of plant (landraces) that has been locally named by elderly informants as *leunca badak* and predominantly named by rural community as *takokak* (based on *emic*). Moreover, this kind of plant, based on botanical name is known as *Solanum torvum* Sw (based on *ethics*). Another kind of *leunca* is locally named by informants as *leunca komir* or predominantly called by rural community as *tomat leutik* (*emic*). According to Botanical name (*ethic*), it has been revealed that *tomat komir* or *tomat leutik* is named as *L. esculentum*. In addition, some elderly informants recognize a kind of *leunca* named as *leunca beureum* that is based on *emic* view recognized as has flower petals purple, fruit red, and wild grow in the forest area, however, based on the botanical analysis it has been precisely known species named, which is considered as genera of *Solanum* or unknown species *Solanum* sp., due to did not find any sample or specimen in the field. While, *leunca bonglot* that is based on informants has distinctive morphological characteristics, including leaves are larger than leaves of other kinds of *leunca*, it has not been identified of scientific name, due to did not find any sample in the field as a result, it can be named as *Solanum* sp. Indeed, among various kinds of *leunca*, *leunca biasa* is popularly known by informants, based on botanical identification is named as *Solanum americanum* Mill. This species has an English name as the Black Shadenight (Samuel 2015). *S. americanum* has various local name in different ethnic groups in Indonesia, namely *leunca* (Sundanese), *ranti* (Javanese), *terong meranti*, *terong paracicit*, *terong perat*, *kelampong puyuh* (Burkill 1935; Siemonsa and Grubben 1996).

Unlike Western knowledge or botanical classification, based on classification of informants (folk classification), three predominant *leunca*, namely *leunca biasa*, *leunca hayam*, and *leunca manuk* are classified based both morphological and its edible or not-edible plant. Traditionally, informants well-known various kinds of *leunca* based on individual experiences on intensive interrelationship between the rural people and the local environment or local ecosystems (Iskandar 2018). These kinds of *leunca* are traditionally classified by informants

based on morphological characteristics, including fruit of *leunca biasa*, *leunca manuk*, and *leunca hayam* has a round, around and shiny smooth skin, and round and shiny when still young and becomes rather wrinkled when ripe, respectively. In terms of leaves, the leaves of *leunca biasa* are similar in that thin and green, while leaves of *leunca hayam* are thick, oval, with clear veins and dark green. □

Another morphological classification, *leunca* can be classified based on fruit size. According to informants, *leunca biasa* was described has a fruit size between two or three times higher than a fruit of *leunca hayam* and *leunca manuk*. In addition, fruit skin of *leunca biasa* is thicker and not easily brittle compared to that of *leunca manuk* and *leunca hayam*. Conversely, the skin fruit of both *leunca manuk* and *leunca hayam* is recognized as thin and easily broken. The characteristics of morphological differences between fruit of *leunca hayam* and *leunca* were mentioned by informants. In terms of fruit size, the fruit size of *leunca hayam* is similar to that of *leunca manuk*. However, the ripe fruit color of *leunca manuk* is black similar to that of *leunca biasa*, while the *leunca hayam* is bright bluish with small array of bright yellow.

Regarding habitat of *leunca*, three variation or kinds of *leunca*, *leunca biasa*, *leunca manuk*, and *leunca hayam* have similar habitats, including roadside, hilly garden dyke, among the trees of young coffee trees, around uninhabited house, cemetery complex, near water channels, home-garden, public bathing place or ritual ablution place of mosque, and village small river. In addition, those kinds of *leunca* were found in forest that is directly adjacent to gardens and settlements.

Some areas of Tarumajaya are owned by the plantation of the PTN VIII. Since the end of the first decade of the twenty-first century, the PTPN has managed the abandoned plantation planted by coffee trees. Some locations of the coffee garden have been planted by *leunca* plants understory of coffee trees. Because of the flowers of *leunca* plant can be considered as distracting of coffee flower disrupting (cf. Withaningsih et al. 2018).

Based on informants (*emic* analysis), it has been recognized 6 variations of *leunca* (*landraces*), namely *leunca biasa*, *leunca manuk*, *leunca hayam*, *leunca badak* or *takokak*, *leunca bonglot*, *leunca beureum*, and *leunca komir*. After all kinds of *leunca* were scrutinized and analyzed by literature (*ethic* analysis), it can be identified those kinds *leunca* consist of 3 species belong to two families, namely *leunca biasa* as *S. americanum*, *leunca hayam* as *Lantana camara* L, *leunca badak* or *takokak* as *S. torvum*, and *leunca komir* or *tomat kecil* as *L. esculentum*, while *leunca bonglot* and *leunca beureum* are considered as *Solanum* sp., but at the present time did not precisely identified due to did not find any sample in the field (Table 1). In other words, *leunca biasa*, *leunca badak* or *takokak*, and *leunca komir* or *tomat kecil* are different species at the same genera, *Solanum* of family Solanaceae, and *leunca hayam* are different species, *L. camara*, while *leunca bonglot* and *leunca beureum* have not been able to identify due to lack of samples. Therefore, both *leunca bonglot* and *leunca beureum* have been predicted the same genera, *Solanum*.

Table 1. Various plants that were named *leunca* based on informants of two villages of upper Citarum (emic analysis) and botanical science (etic analysis)

Local name	Characteristics based on informants (emic analysis)	Botanical name (Siemonsa and Grubben 1996).	Main characteristic based on botanical science (etic analysis) (Siemonsa and Grubben 1996)
<i>Leunca biasa</i>	Tree height approximately between 1,200 cm and 1,500 cm. The fruit is a globular berry bigger than other <i>leunca</i> variations. The fruits are rather bright green rather bright green when it is ripe bright green and black purple. The leaves are slightly oval with edges flat, rather bright green.	<i>Solanum americanum</i> Mill), Vernacular name: Glossy nightshade. Local names: <i>leunca</i> (Sundanese); <i>ranti</i> (Javanese), <i>kampai</i> ; Malaysia: <i>ranti</i> , <i>terong meranti</i> , <i>terong perat</i> .	Glossy nightshade is an erect and short-lived perennial herb, up to 1.5 m tall, unarmed, dark green or flushed with purple, glabrous or sparsely hairy with curved simple hairs. Stem terete, angular or narrowly winged, sometimes warty. Leaves arranged spirally to almost opposite, variable in size. Fruit a globular berry, 0.5-1 cm in diameter, from green turning glossy bluish-black or purplish-black at maturity, readily shed when ripe; flesh with 0-4(-8) sclerotic granules and 40-100 seeds. Seed discoid, 1-1.5 mm long, creamy.
<i>Leunca manuk</i>	Shrub of 500-1,200 cm tall. Fruit a very small globular in a group, unripe fruit light green and turning dark black when ripe. The tape of leaf has a pointed shape.	A variety of <i>Solanum americanum</i> Mill	-
<i>Leunca hayam</i>	Tree high is approximately 1,000-1,500 cm. Fruits are small in group purple color with yellowish glow. Leaves are rather round at the base and taper at the end and thick, dark green.	<i>Lantana camara</i> L.; Family <i>Verbenaceae</i> . Local names: <i>saliara</i> (Sundanese); <i>temblekan</i> , <i>kembang telek</i> (Javanese)	Shrub of 1-2 m. Branches usually acuminate, with sessile glands when young. Leaves opposite, rarely ternately whorled, ovate, contracted into the petiole, densely hispid on upper surface shortly pubescent beneath. Young flower pale, turning with age to pink or red, frequently with an orange eye, tube curve, inside coated with obliquely erect hair. □
<i>Leunca badak</i> or <i>takokak</i>	Shrub of individual mature has height 2,000-2,200 cm, stem and leaf twig have thorns. Leave is an oval with the base of leaf rather round with its tip not pointed. Branch short flower stalk. Fruit a globular green not shiny similar to that of <i>leunca biasa</i> but higher.	<i>Solanum torvum</i> Swartz., Vernacular names: Devil's fig, Plate brush. Local names: <i>takokak</i> , <i>pokak</i> (Javanese); <i>terong pipit</i> (Sumatra); <i>terong pipit</i> , <i>terong rembang</i> (Malaysia).	Shrub with up to 3 m tall, pubescent with stellate hairs. Prickles scattered on stem, branches, and leaves, especially in younger growth, 3-7 mm long, slightly hooked. Leaves alternate, solitarily or in pairs. Fruit a globular berry, 1-1.5 cm in diameter, yellowish, glabrous, produced in clusters of few to 10. Seeds 300-400 per fruit, flat, 1.5-2 mm long, brownish.
<i>Leunca bonglot</i>	Annual shrub of individual mature 600-1,000 cm tall. Jagged leaves with sharp edge. Fruit a globular beery shiny green separated not grouping similar that of <i>leunca biasa</i> , <i>leunca manuk</i> , and <i>leunca hayam</i> .	<i>Solanum</i> sp*), Family Solanaceae	-
<i>Leunca beureum</i>	Herb of individual mature approximately 1,000-1,500 cm high. The leaves are rather long similar to that of the potato. Flower petal is purple, and red fruit when ripe. In the past, it was predominantly grown in forest bordering of settlement.	<i>Solanum</i> sp*), Family Solanaceae	-
<i>Leunca komir</i> or <i>tomat kecil</i>	Mature annual herb of approximately 200-250 cm tall. Stem and leaves have feathers. Flower is yellow. Fruit a berry green when young and red when ripe. It is usually grown in homegardens and edge of the forest.	<i>Lycopersicon esculentum</i> Mill, Syn. <i>Solanum lycopersicum</i> L; <i>Lycopersicon lycopersicum</i> (L) Karsten, Family Solanaceae. Vernacular names: tomato, love apple Local names: <i>tomat</i> (Indonesia); <i>tomato</i> (Malaysia).	Variable annual herb, up to 2 m or taller. Stem solid, coarsely hairy and granular. Leaves spirally arranged with 2/5 phyllotaxy. Fruit a berry, flattened, globular or oblate, smooth or furrowed, 2-15 cm in diameter, green and hairy when young, glorious and shiny, red, pink, orange or yellow when ripe.

Note: *) This plant cannot be identified because of did not find plant sample in the field, only based on information of the informants



Figure 3. A. *Leunca biasa* (*Solanum americanum* Mill). B. *Leunca hayam* (*Lantana camara* L). C. *Leunca komir* or *leunca kecil* (*Lycopersicon esculentum* Mill). D. *Leunca badak* or *takokak* (*Solanum torvum* Swartz)

Agronomical knowledge and uses of *leunca biasa*

Leunca has been traditionally cultivated by rural people in homegarden (Table 2). In addition, sometimes, leuca has planted in garden or mixed-garden. Unlike other commercial vegetables, *leunca* has cultivated by mixed-cropping with other annual as well as perennial crops of homegarden system. While in the garden, *leunca* is predominantly cultivated as mixed-cropping with other annual crops. *Leunca* is traditionally propagated by seeds. It is usually sown in seed-beds or pots in the homegrden. Moreover, approximately several weeks after sowing, when the plants are about 5-10 cm tall are planted in the homegarden or garden.

In Tarumajaya Village, for example, it has been recorded at least 4 households has cultivated *leunca biasa* in their homegardens (Table 2; Figure 4). Those *leunca biasa* has been planted in area of no more 1-2 m² of the home garden with 8-16 individuals. According to informants who commonly planted *leunca biasa* cultivation of *leunca biasa* is similar to that of tomato (*L. esculentum*). It is mainly cultivated by making nursery of ripe seeds. Traditionally, cultivation of *leunca biasa* consists of some stages. Firstly, seeds are sown on the soil that has been hoed (*dipacul*) and loosened (*dilaci*) previously. Secondly, after seedlings grow between 4 weeks and 6 weeks that have approximately 10 cm tall, are selected. Thirdly, good individuals are planted in the garden with the spacing of one individual with another individual approximately 40 x 40 cm.

According to farmers of Tarumajaya Village, since the agricultural land has been considered as fertile, the planting *leunca biasa* is not necessarily provided by fertilizer. However, it is deemed and fertilizer availability, these crops are given fertilizers of chicken dungs put surrounding plants (*disaeur*). The fertilizers are mainly obtained from residual fertilizer for their vegetable garden. Unlike common vegetable, the *leunca* garden (*kebun leunca*) has rarely weeded regularly (*dikaramas*) or sprayed by herbicides (*diobat*).

Forth, when *leunca biasa* has grown approximately of between 10 weeks and 12 weeks, both fruits and leaves have been readily harvested. Fruits that are nearly mature owning characteristics, including green fruit mixed several purplish have been considered as appropriate time to be harvested.

This traditional practice of cultivation of *leunca* is rather similar to that of commonly undertaken by farmers of Soreang, South Bandung, the *leunca* crops are mainly planted in garden of the *kebun-talun* system, by providing manure of predominant bamboo biomass burning ash and livestock manure and without spreading herbicides. In addition, the *leunca* crops are predominantly planted mixed with other annual crops, and generally under shading other crop canopies, including corn crops (Iskandar and Iskandar 2011; Iskandar and Iskandar 2013).

According to informants, if farmers want to harvest leaves, the *leunca biasa* plants must be planted in the shading area. On the basis of the framer experiences, the *leunca* crops planted in the shading area, producing wide leaves, while planted in the full sun area of non-shading canopy of other crops producing small wide leaves that has close relation with their photosynthetic characteristics as function of light intensity (cf. Christanty et al 1978). Based on some observations, the *leunca biasa* have been planted in shading area producing leave size approximately between four and five times of that of planted in the full sun area without shading of other plant canopies. As a result, one harvest from each trunk can be harvested approximately 20-28 grams of leaves, and its leaves can be commonly harvested at least for time before trunks are being cut. In addition, one of reasons the *leunca biasa* has been planted in full-shade or half-shade, the taste of the fruits is not so bitter compare to that of plant in the full-sun area. In addition to wider leaves, the leaves of *leunca biasa* planted in full-shade have a sweeter taste.

Conversely, if the main purpose of planting *leunca biasa* to harvest a lot of fruits, the *leunca* crops are better planted in the full-sun area by getting direct sunlight. The

leunca biasa planted in full-sun area may produce smaller leaf size. Because the farmers have not planted *leunca biasa* in the full-sun area, we direct comparing between planted *leunca biasa* planted in the full-sun area of the garden and *leunca biasa* wild grown in the full-sun area. The result showed that the farmer ecological knowledge and their perception were confirmed that leaves of *leunca biasa* grown in the full-sun area producing smaller size, approximately 10-20% smaller size of the leaves of *leunca* crops planted in the full-shade area. Indeed, based on direct measurement, one harvest each individual trunk can be harvested about 300-350 gram of fruits of *leunca* without harvesting leaves. However, if individual *leunca biasa* that was harvested leaves, each individual can be harvested approximately 180-200 grams only. This production is much lower compared to that of production based on experience undertaken by Fortuin and Omta (1980) in horticultural garden in Lembang, Bandung, Indonesia. According to Fortuin and Omta, each individual *leunca* after planting 113 days, can be harvested about 1,070 grams of fruits.

In addition, based on informants, the fruit production of *leunca biasa* can be determined by season conditions, range of up-down of daily temperature. Generally, *leunca* produced a lot of fruits on the dry season when average of daily temperature is higher than that of the rainy season. Traditionally, *leunca* has not been cultivated in emphasized as commercially cultivated. As a result, *leunca* has predominantly planted with other crops in homegarden or mixed-garden. For example, the mixed-garden or *kebun-talun* system of approximately 0.5 ha, in Karamat Mulya Village, Soreang, Bandung planted by *leunca* (*S. americanum*), ketimun (*Cucumis sativus*), cable rawit (*Capsicum frutescens* L.), bamboo, fruit, and woods, *leunca* harvested 200 quintals of sold Rp. 200.000 or only 3% of the total mixed-garden or *kebun-talun* system productions (Rp. 6,471,600/0.5 ha) (Nuryani 2002). Therefore, because of *leunca* has predominantly cultivated as small scale of farming system in homegarden system and commonly sold on local market, no-production figures are available in local as well national level or international level. Only figures from one experiment in Indonesia, *leunca* plants were harvested until 4 months after planting in the field; mean fruit yield was 30 kg per 10 m² (30 ton/ha) when leaves were not harvested, and 16 kg per 10 m² (16 ton/ha) when also 0.8 kg edible leaves per 10 m² (0.8 ton/ha) were harvested (Siemonsma and Piluek 1994).

Leunca can be classified into two categories, namely edible and not edible *leunca*. According to informants both fruit and leave of *leunca hayam* (*L. camara*) have never been eaten due to consider as poison. However, leaves of *leunca hayam* can be used as traditional medicine for poultry, namely leaves are boiled and the boiled water mixed with water drunk on sick chicken (cf. Partasasmita et al. 2017). The leaves of *L. camara* has predominantly used as poultry medicine (*boat hayam*). Therefore, this plant is locally named as *leunca hayam*. In addition, leaves of *leunca hayam* can be used as cure against abscess, colic, nausea, as diaphoretic, against tumefaction, rheumatism. While root this plant can be used as traditional medicines,

including against gonorrhoea, syphilis, depurative, and leucorrhoea (PT Eisai 1986).

Leunca manuk (a variety of *S. americanum*) is most distinctive characteristic a very small globular in a group, has predominantly consumed only leaves as boiled vegetable (*lalab kuluban*) or cooked mixed with fishes. Since fruits of this kind of *leunca* have been predominantly eaten by bird (*manuk*), the local name of this *leunca* is called *leunca manuk* (bird *leunca*). Traditionally, *leunca manuk* has been usually eaten by children only as a snack while are plying.

Among various plants named *leunca*, only *leunca biasa* (*S. americanum*) has predominantly consumed by rural people of Upper Citarum, West Java. It has been traditionally consumed both fresh fruits and leaves (Table 2).

Traditional institutional aspects of *leunca*

'Institutional aspect of *leunca*' in this article may be defined as social rules that apply in social daily life in the community some kind of guidance in interaction between people with distribution of *leunca*.

All farmers in two villages of the study area, namely Tarumajaya and Sukapura are vegetable farmer that in village or district statistical data is classified as farmer of 'horticultural strategies', including farming of kentang (*S. tuberosum*), tomat (*L. esculentum*), bawang daun (*A. fistulosum*) and kol (*B. oleracea* var *capitata*). Although many farmers have engaged in farming commercial vegetables, *leunca* has not been cultivated as the garden monoculture, but traditionally cultivated as mixed-cropping with other crops in homegarden or *kebun-talun* system (Nuryani 2002; Iskandar and Iskandar 2011). However, based on interview and observation on selling and consumption of *leunca*, it was revealed that *leunca* is predominantly sold in the vegetable stalls of local traditional market and small shops (*warung*) that selling good daily need. In addition, *leunca* whether as fresh vegetable or as part of main component of the dishes has not only been widely recognized but also consumed by rural people at least between 2 times and 4 times each week.

Leunca in both villages, Tarumajaya and Sukapura has been commonly distributed until household consume as last consumers mainly through institutional market channels. It has been recorded two marketplaces in Sukapura Village recognized in that place there was a sale and purchase transaction. On one place it has permanent building, and another one busy trading once a week. *Leunca* has been predominantly sold only in the permanent market of Cibereum (Figure 5). As a result, most people have commonly gone to Pasar Baru of Cibereum located in Cibereum Village. It has been recorded one trader who especially trading *leunca* as main commodity.

Leunca fruits were sold in level of traders of Sukapura market and Pasar Baru of Cibereum between Rp 10,000 and 12,000 per kg. However, in level of small shop (*warung*), *leunca* was commonly sold between Rp 3,000 and Rp 3,500 per package (about 180-200 grams). In commonly sell daily needs of rural people, only one

warung has not sold *leunca* due to not selling vegetables. In Sukapura Village has been recorded 46 *warung* that is similar that of in Tarumajaya, only 14 *warung* not sold vegetables, including *leunca*.

Table 2. Cultivation of *leunca* planted in homegarden system and tradition of *leunca* consumption as vegetable dishes

<i>Leunca</i> planted in homegarden	Sukapura Village		Tarumajaya Village	
	Number of respondents	Percentage of the total	Number of respondents	Percentage of the total
<i>Leunca</i> planted in homegarden	8	20	4	10
Consumed <i>leunca</i> as vegetable dishes	40	100	40	100
Not consumed <i>leunca</i> as vegetable dishes	0	0	0	0

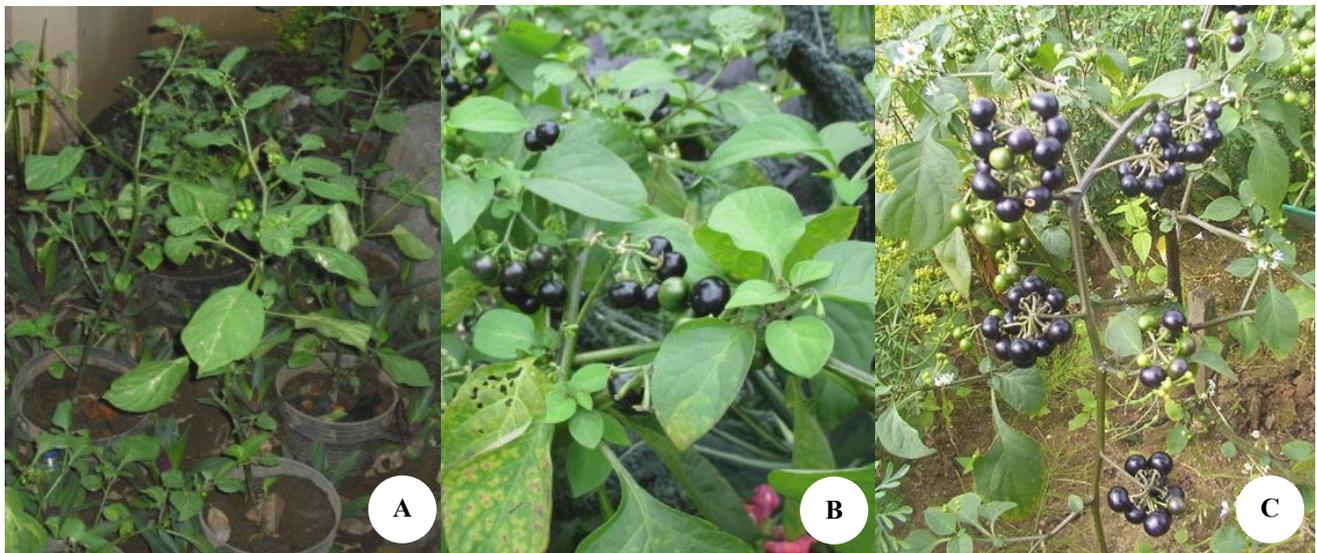


Figure 4. A. Nursery of *leunca biasa* (*Solanum americanum* Mill) in the home garden. B. *Leunca biasa* planted in the homegarden of Upper Citarum, West Java. C. *Leunca biasa* planted in a garden (*kebun*) of Upper Citarum, West Java, Indonesia



Figure 5. A. *Leunca* has been predominantly sold in Pasar Baru of Cibereum, Cibereum Village, West Java, Indonesia. B. *Leunca* has been predominantly sold in the vegetable stall traders

Approximately *leunca* fruits have been predominantly sold in every day recorded between 8 packages (14-16 ons) and 12 packages (2.1-2.4 kg). If it is calculated based minimum number used as standard, average *leunca* was daily consumed by rural people of Tarumajaya Village estimated 35 kilograms, and 44.8 kg in Sukapura Village. Based on consumption habit of respondents, at least *leunca* daily consumed by respondent households estimated 1,050 kg/per month (Rp. 10.500.000-Rp. 12,600,000) of Tarumajaya households, and 1,344 kg/month (Rp. 13,440.000-Rp. 16.128.000) of Sukapura households with assumption each household consumed *leunca* as vegetable dishes in everyday menu. Although based on economic value *leunca* is not too high as other vegetable crops, including *bawang daun*/spring onion, *tomat*/tomato, *sawi*/Indian Mustard, *kentang*/potato and *kubis* or *kol*/cabbage, and since both villages have not been recognized as place of *leunca* cultivation, average level of consumption of *leunca* has been considered as high. Indeed, it can be seen that *leunca* has been daily part of rural people live.

In addition to through relations based on market mechanism, distribution of *leunca* can also be undertaken through neighboring and kinship relations. On the basis of information from four households who semi-intensively cultivated *leunca* in their homegarden, it can be revealed that asking (*nyuhunkeun*) and borrowing (*nambur* or *nginjeum*) of *leunca* among neighboring and kinship relations with the *leunca* owners. The relationship of asking *leunca* is different from borrowing *leunca*. In the relationship of lending and borrowing, if a neighboring or relatives borrow a small amount of *leunca* fruits, the borrower must return the same amount as *leunca* she borrowed at another time; even though the return transaction is always accompanied by words that indicate that the lender feels ashamed to receive the return the size she requested. While in relationship of asking and giving, the recipient is not obliged to request the return of a number of *leunca* fruits to the giver. However, there is a kind of norm that requires the recipient of *leunca* at other times to provide certain amounts of things other than *leunca* to the giver *leunca*; even though usually the giver or the person who behalf of the giver while the requestor is replying to his gift always mention that the requester does not need to do that.

Whether relation of asking and giving of *leunca* or borrowing and returning of *leunca* is both it is considered as in the context of neighboring social relations. It means both relationships are based on the showing of close relation of physical, personal or social closeness or a combination of the three kinds of relationships among parties involved. Physical closeness can be fulfilled considering that the event of borrowing and asking can only occur between those who live in an affordable space by just a few steps (*salangkah*). However, because the closeness of space often also causes conflicts, therefore, the personal proximity requirement must also be fulfilled. People who are involved in both relationships are usually people who know each other well. As a result, this has to do with the third prerequisite, namely social closeness. The

people involved not only know each other, but also understand the reasons behind being asked for requests or loans; because they are in the same social situation either because they are both poor, both work for the same farmers or also because they have patronage and kinship relationships.

Various things that occur behind the relationship of borrowing and giving *leunca* are usually related to unexpected events, such as the arrival of guests who are considered entitled to be served meals, unplanned activities, such as special cooking in a pan (*ngaliwet*) or the events when the required *leunca* are not available in the nearest small shop (*warung*).

***Leunca* in local culinary culture**

People of two villages of the study area consume both fruit and leave of *leunca*. Leaves of *leunca manuk*, *leunca hayam*, or *leunca biasa* are usually presented as parts of dish mixed with fish, wrapped in banana leaf and burned with burning ash (*dipepes*) or consumed as fresh vegetable after cleaned by water or soaked in hot water for a while (*dileob*) or steamed (*seupan*) with other vegetables, particularly leaves of cassava and *paria* (Table 3).

Unlike *leunca manuk*, fruits of *leunca biasa* are usually consumed as part of daily dishes of the households. In addition, the leaves of *leunca biasa* are usually served limited, while fruits of *leunca biasa* are usually served with dish varieties. The *leunca biasa* fruits are most popularly consumed as fresh vegetable.

According to Suriawiria (2006), fresh vegetable has been part of life and culture of Sundanese people, in West Java. In two villages of research area, the fresh vegetable has also embedded in local culture. Based on survey with structured interview with 80 households, all respondent (100% of respondents) mentioned that they have also always dished up fresh vegetable as part of daily menu, particularly for lunch menu, and eat interlude between breakfast and lunch, also between lunch and dinner, that is called as *ngawadang*. Based on respondents, it has been revealing that daily menu of lunch and *ngawadang* during one-month, average *leunca* used as dish food was recorded between 16 and 18 times as fresh vegetable. Rating of *leunca* was presented as a food dish 23 times of the months, under ranking of cucumber/bonteng nearly every day of the month. However, *leunca* is more presented as fresh vegetable compared to that other vegetable, including *salada bokor*, *kacang Panjang*, *surawung*, *terong hejo*, *kol*, and *tespong*.

In local culinary structure, *leunca* was commonly served with rice and fried foods, including freshwater fish, salted fish, soybean *tempe*, chicken meat and tofu/soybean *tahu*, *leunca* and other fresh vegetables, and traditionally mixed with *sambel* (Sundanese sauce). It has been popularly known special *sambel*, namely *sambel terasi* (chili shrimp paste) is strongly combined dish with the fresh *leunca* fruits. Traditionally, *sambel terasi* is made of *terasi* or *balacan* (chili shrimp paste or fish paste), *cabe rawit*/*cegek*, *cabe merah*, salt, sugar/brown sugar, *bawang merah*, and soaking water of *asem koak*/*asam Jawa* or substituted by *jeruk sambel* or *jeruk limau* or *jeruk purut* (Table 3).

Another the food dish of fresh fruit *leunca* was served as *pencok leunca* and *karedok*. Both food dishes have basic structure not only *leunca* fruit but also with other spices. *Pencok* is kind of food dish as *sambal* (souce) was made of *bawang merah*, *bawang putih terasi*, *cikur* (*Kaempferia galanga* L), *gula Jawa*/brown sugar, *surawung*, and salt. All basic materials, except *surawung* were pounded (*tumbuk*, *ulek* or *rendos*). After processing resulted half smooth, *hiris* was put mixed with *surawung* and stirred. In food dish of *pencok leunca*, all basic materials are similar to that of *karedok*, except *hiris* is replaced by *leunca* fruits.

It has also been known in Sundanese food dish that *karedok* is not always consisting of *leunca*. Similarly, *pencok* is principally as *karedok* namely is a kind of sauces with has more constituent elements. The constituent elements of *karedok* namely *cabe rawit/cengek*, *bawang merah bawang putih*, *cikur* (*Kaempferia galanga* L), *surawung* (*Ocimum bacilicum* L), *kacang tanah* soaking water of *asam Jawa*, *gula merah*, *terasi*, and salt. All materials, except *surawung*, are pounded. After processing it has been resulted in a kind of paste, *surawung* and other vegetables are put together. A dish food is named *karedok leunca*, if one kind of vegetable is used mixing with the paste namely *leunca* fruits. Like food dish of *pencok*, *leunca* is not fixed component. *Leunca* fruits can be replaced by *kacang panjang* or *terong*.

There is one kind of special food dish of Sundanese people that *leunca* is known as main identity, namely *ulukutek*. Principally the *ulukutek* is categorized as food dish of 'tumis-tumisan' (stir fry) or is cuisine is made of by stir frying (*ditumis*) with using little cooking oil in kettle with low hot frying. Unlike other food dishes, *ulukutek* is the only one that has strong association with *leunca*. Indeed, without the name suffix of *leunca*, everybody knows that *ulukutek* is food dish with main component consists of *leunca* fruit and *oncom* (fermented *kacang tanah/suuk*). Main components of *ulukutek* consist of *cabai hijau* and/or *cabai merah*, *cabe rawit*, *bawang merah* (*Allium cepa* var. *ascalonicum*), *bawang putih*, *tomat terasi*, leaves of *salam*, *sereh*, *bawang daun*, *cikur*, salt and brown sugar (Tabel 3). Processing of making *ulukutek* is undertaken by several stages. Firstly, main basic components are cooked in a kettle with little cook oil (*dioseng*). Secondly, after frying produces fragrant is indicated ready and put pounded *oncom*. Thirdly, after all spices have properly mixed with *oncom*, finally *oncom* is put it. Forth, before *leunca* fruits are being overcooked (*genjur*), food dish removed from the kettle and ready to be served at the dining table.

In addition to *ulukutek*, there is two food dish of *leunca*, namely *angeun leunca* (*leunca* soup) and *oseng leunca* (stir frying of *leunca*). Based on the questioner, although all respondent knew 'angeun leunca', all of them claimed have not consumed the *angeun leunca* anymore. Based on informants, there are two kinds of *angeun leunca* namely it was cooked with *tauco* and also cooked with coconut milk. The firstly, cooked with *tauco* is similar with *ulukutek* but has broth, while the secondly, cooked with coconut milk, is similar to *sayur lodeh*. Unlike *ulukutek*, in this food dish, *leunca* is overcooked (*genjur*). As a result, element of its

crispness has totally disappeared.

Oseng leunca is principally known as one kind of 'tumis-tumisan' (stir fry). Like *ulukutek*, main spice of *oseng leunca* is *oncom* or often also replaced by *tempe*, and *leunca* fruits. Basic cooking ingredient *oseng* consists of *bawang putih*, *bawang merah*, *cabai hijau besar*, *cabe rawit/cengek* (*C. frutescens*), *cabe merah besar* (*Capsicum annum* L), leaves of *salam* (*Syzygium polyanthum* L), *bawang daun*, *tomat* salt, and sugar. Like all kind of *tumis-tumisan* (stir fry), *oseng leunca* was cooked with little cook oil on a kettle with frying medium fire. After all basic spices were cooked by stir frying (*ditumis*), *oncom* or *tempe* that has been cut into small pieces were put. After all spices were properly mixed with *oncom*, later on *leunca* was put it, stirred, and before *leunca* was overcooked, the *oseng leunca* was lifted from a kettle. On this basis, it can be inferred that at least 23 crop species and its parts have been predominantly used for traditional dish food with have relation with *leunca* (Table 3).

***Leunca* and Sundanese food menu habit**

On the basis of most people who have ever been consumed *leunca* fruits, if they have tried to consume *leunca* fruits, they may be do not like to consume *leunca* fruits. For example, this study was carried on rural Sundanese community, but there is one household who has identified as a Javanese and is predominantly called by local people as "urang Wetan" (Eastern people) is documented in this study area. When a household leader asked his perception on *leunca* whether as fresh vegetable or as dish food it has been revealed that he mentioned that do not so like to consume *leunca* due to he has not commonly consumed *leunca*. He has known *leunca* which is called in his initial hamlet as 'ranti'. In Javanese of Central Java, unlike in rural people of West Java, *ranti* has commonly used based on old people in hamlets recognized as traditional medicines, including stomach ache. Of traditional medicines, it has been confirmed by Eisai (1986) that *leunca* which is known as *ranti* in Javanese leave and fruit are recognized as traditional medicines, including exophthalmia, dysuria, dropsically swelling, hypertension, anemia, and constipation. Similarly, according to Burkill (1935), *leunca* (*Solanum americanum* L) is locally named as *ranti*, *terong meranti*, *terong paracicit*, *terong perat*, *kelaamong puyuh*, and *leunca* recognized as vegetable. This plant is very distributed plant, found as weed in temperate regions, and there are reputed to be poisonous, but in the tropics, throughout which it occurs, it is used as a pot-herb. In the Malay Peninsula it is found all down the west side, but singularly its occurrence is not recorded for the east side. It is brought to market, sometimes as 'daun ranti'. The tender shoots are boiled as spinach in India, Indo-china and through Malaysia. Usually, they are much liked, but the plant is not cultivated at all. The alkaloid solanine has been detected in seeds examined in Europe. In China the leaves, stalk, and roots are applied to wound and sores, and, again, the young shoot, like spinach, is considered tonic. In India the berries and the juice are medicinal and the plant is considered beneficial when taken as spinach. Apparently, its action is laxative and diuretic.

Table 3. Various plant species that have relation with *leunca* in local culinary structure

Local name/ Indonesia	Common name	Scientific name	Part that has relation to <i>leunca</i>	In culinary context as
<i>Bonteng/mentimun</i>	Cucumber	<i>Cucumis sativus</i> L.	Fruit	Fresh vegetable
<i>Salada bokor</i>	Lettuce	<i>Latuca sativa</i> L.	Leaf	Fresh vegetable
<i>Tespong</i>	Java water dropwort	<i>Oenanthe javanica</i> L.	Leaf	Fresh vegetable
<i>Surawung/kemangi</i>	Holi basil	<i>Ocimum sanctum</i> L.	Leaf	Fresh vegetable, raw material of <i>pencok leunca</i>
<i>Terong hejo/ terong hijau</i>	Eggplant	<i>Solanum melongena</i> L.	Fruit	Fresh vegetable
<i>Kacang panjang</i>	Cowpea	<i>Vigna unguiculata</i> L. Walp.	Fruit	Fresh vegetable
<i>Kol/kubis</i>	Cabbage	<i>Brassica oleracea</i> var. <i>capita</i> L.	Leaf	Fresh vegetable
<i>Asem koak</i>	Tamarind	<i>Tamarindus indica</i> L.	Fruit	Spices of <i>sambal terasi</i>
<i>Jeruk sambel/ jeruk purut</i>	Kaffir lime	<i>Cytrus hystrix</i> L.	Fruit	Spices of <i>sambal terasi</i>
<i>Cengek/cabe rawit</i>	Chili pepper	<i>Capsicum frutescens</i> L.	Fruit	Spices of <i>karedok</i> and <i>pencok leunca</i> , component of <i>sambal terasi</i>
<i>Cabe beureum/ cabe merah</i>	Red pepper	<i>Capsicum annum</i> L.	Fruit	Spices of <i>oseng leunca</i> , <i>ulukutek</i>
<i>Cabe hejo/ cabe hijau</i>	Green pepper	<i>Capsicum annum</i> L.	Fruit	Spices of <i>oseng leunca</i> , <i>ulukutek</i>
<i>Tomat</i>	Tomato	<i>Lycopersicon esculentum</i> Mill.	Fruit	Component of <i>sambal terasi</i>
<i>Sampeu/ singkong</i>	Cassava	<i>Manihot esculenta</i> L.	Leaf	Boiled vegetable
<i>Bawang daun</i>	Spring onion	<i>Allium fistulosum</i> L.	Leaf	Component of <i>ulukutek</i> and <i>oseng leunca</i>
<i>Cikur/kencur</i>	Aromatic ginger	<i>Kaempferia galanga</i> L.	Rhizome	Spices of <i>karedok leunca</i> , <i>pencok leunca</i> , and <i>ulukutek</i>
<i>Kawung/aren</i>	Sugar palm	<i>Arenga pinnata</i> L.	Arenga juice/ <i>nira</i>	As brown sugar for using spices of <i>ulukutek</i> and <i>karedok leunca</i>
<i>Bawang beureum/ bawang merah</i>	Onion	<i>Allium cepa</i> var. <i>ascalonicum</i> (L) Back)	Bulb	Spices of <i>ulukutek</i> , <i>oseng leunca</i> , and <i>karedok leunca</i>
<i>Bawang bodas/ bawang putih</i>	Garlic	<i>Allium sativum</i> L.	Bulb	Spices of <i>oseng leunca</i> , <i>pencok leunca</i>
<i>Sereh/serai</i>	Citronela grass	<i>Cymbopogan nardus</i> L.	Stem	Spices of <i>ulukutek</i>
<i>Salam</i>	Indonesia bayleaf	<i>Syzygium polyanthum</i> L.	Leaf	Spices of <i>ulukutek</i>
<i>Kalapa/kelapa</i>	Coconut	<i>Cocos nucifera</i> L.	Fruit	Spices of <i>angeun lodeh leunca</i>
<i>Suuk/kacang tanah</i>	Groundnut	<i>Arachis hypogaea</i> L.	Fruit	Spices of <i>karedok leunca</i>

Moreover, based on the Javanese informants, who tasted of *leunca* or *ranti* he has not been liked as bitter and sensation as little bit hot in the mouth, like chewing tobacco. Therefore, they were rather surprised that why Sundanese people eat *leunca*, it seems like don't feel bitter, even willing to buy it for Rp. 3,500 in a small shop only for a handful (180-200 g) of *leunca* fruits.

The amazement of 'urang Wetan' (Javanese people) on Sundanese customer to consume *leunca* and they did not like taste of *leunca* is not something natural. The assessment comes from what anthropologists call "habitus" or habits that are internalized from a very early age about what is permissible/not permissible and delicious unpleasant.

On the basis many social structures that exist around the lives of individuals, the nuclear family is a structure that has the most influence on the formation of individual food tastes and preferences. According to respondents, generally, they claimed known *leunca* since childhood. Their first information on *leunca* was obtained from seeing their mother serving *leunca* as fresh vegetable (*lalab*) as one of the daily menus in the household. Moreover, they

obtained information when they saw their family eating *leunca* fruit on many occasions and in a variety of dishes, either raw or cooked. By imitating, some experiments in the family shaped personal preferences which then evolved from merely an understanding that *leunca* could be eaten. Moreover, they understood *leunca* could be eaten in various ways served and delicious taste.

Since each family in study area of both villages have closed interrelationship with other families with reference similar food dish, not surprisingly, the preference for *leunca* will also be strengthened by a wider social structure other than the family. As time has changed over time, the appetite for *leunca* that is part of the collective taste is ingrained in an individual's body as if it were natural. For Sundanese people, *leunca* is not only delicious to eat but also something delicious that is natural. *Leunca* is considered something that has become part of the body unless there is a time when enculturation *leunca* is cut off from the lives of individuals before the taste of *leunca* is embodied. This is because of moving to a place that does not know *leunca* as food or because there is a prohibition to consume *leunca*.

consumed, but its leaves have been used as traditional medicine of pet chicken disease.

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REFERENCES

Figure 6. *Leunca*, ‘*ulukutek leunca*’, and other raw vegetables are being offered in a Sundanese restaurant

The *leunca* links with the identity of the Sundanese is not only raised when ‘*urang Wetan*’ (Javanese) is asked to assess the habits of his Sundanese neighbors to consume *leunca*. Based on survey to 20 restaurants or cook shops (*rumah makan*) that served special Sundanese food, it could be revealed that all cook shops served fresh vegetables. Composition of fresh vegetables consists of *leunca*, *mentimun*, *seladah bokor*, *kemangi*, *kacang panjang*, and *tespong* were predominantly found in cook shops. Apart from the diverse composition of fresh vegetable (*lalaban mentah*), *leunca* as fresh vegetable was found in survey of 20 restaurants.

Aside from being fresh vegetable *lalab*, *leunca* was also served as a processed dish. There are two processed dishes made from *leunca* which were usually offered in 20 restaurants or cook shops, namely *karedok leunca* and *ulukutek* (Figure 6). *Pencok* or *sambal leunca* was offered at around 14 restaurants. While *oseng leunca teri* was offered in 12 restaurants.

The predominant of restaurants or food shops serving ‘Food Sundanese specialties’ in cities, including Jakarta and Bandung which almost all serve *leunca* dishes; showed that *leunca* is not just food, but an important component of the Sundanese identity. At the very least, the existence of *leunca* in these restaurants is a symbol of the authenticity of the Sundanese.

In conclusion, based on informants it has revealed that 7 kinds of plant that are named as *leunca*, however, only 3 kinds of *leunca* that are grown in their village. Among 7 kinds of landraces of *leunca*, *leunca biasa* (*S. americanum*) has been predominantly consumed both fruits and leaves. There are various foods dishes are consumed fresh or cooked. Various dishes of *leunca biasa* have been culturally integrated everyday life of people and culturally as a part of people identity of Sundanese people (*urang Sunda*). Other kinds of *leunca*, including leaves of *leunca manuk* (variety of *S. americanum*) have been consumed *leunca* as cooked vegetable, and its fruits consumed as snack, while *leunca hayam* (*L. camara*) has not been

- Abdoellah OS, Marten GG. 1986. The complementary roles of homegardens, upland fields, and rice fields for meeting nutritional needs in West Java, in Marten GG. (ed.) Traditional agriculture in Southeast Asia: a human ecology perspective. Westview Press, Boulder, CO. □
- Abdoellah OS. 1985. Food consumption of Sundanese in Selamungkal hamlet, West Java, in Suzuki S, Soemarwoto O, Igarashi T. (eds.). Human ecological survey in rural West Java in 1978 to 1982: a project report. Nissan Science Foundation, Tokyo. □
- Alexiades MW, Sheldon JW. 1996. Selected guidelines for ethnobotanical research: a field manual. The New York Botanical Garden, Bronx.
- Backer CA, Bakhuizen VD, Brink Jr RC. 1968. Flora of Java Vol.1-3. Wolters-Noordhoff NV, Groningen.
- Brush SB. 2000. Ethnoecology, Biodiversity, and Modernization in Andean Potato Agriculture. In Minnis PE (ed), Ethnobotany: A Reader. The University of Oklahoma Press, Norman.
- Burkill HI. 1935. A dictionary of the economic products of the Malay Peninsula. The Crown Agents for Colonies, London.
- Christanty L, Priyono, Iskandar J, Soemarwoto O. 1978. Relation of light requirement and site planning of homegarden plants. Paper presented in the seminar on the ecology of homegarden II, Institute of Ecology, Padjadjaran University, Bandung, Indonesia, 25-26 October [Indonesian].
- Cotton CM. 1996. Ethnobotany: principles and applications. John Willey and Sons. London.
- Creswell JW. 1994. Research design: qualitative and quantitative approach. Sage Publication, London.
- Cunningham AB. 2001. Applied ethnobotany: people, world plant use and conservation. Earthscan, London.
- de Bie HCH. 1901. The agriculture of the local population on Java. G. Kolff & Compagnie. [Dutch]
- Edmond JM, Chweya JA. 1997. Black nightshades: *Solanum nigrum* L. and related species. IPGCPR, Rome.
- Eisai Indonesia. 1986. Medical herb index in Indonesia, PT Eisai Indonesia, Jakarta. [Indonesian].
- Ekadjati ES. Sundanese culture: a historical approach. Putaka Jaya, Jakarta [Indonesian].
- Fortuin FTJM, Omta SWP. 1980. Growth analysis and shade experiment with *Solanum nigrum* L., the black nightshade, a leaf and fruit vegetable in West Java. Netherlands J Agri Sci 28 (4): 199-210.
- Hasskarl JK. 1845. Drawings about the use, by the inhabitants of Java of some plants: from that island ascribed. Johannes Müller, Amsterdam [Dutch].
- Heyne K. 1987. Useful plants of Indonesia. Badan Litbang Kehutanan, Jakarta. [Indonesian].
- Igarashi T. 1985. Some notes on the subsistence in a Sundanese village, in Suzuki S, Soemarwoto O, Igarashi T. (eds.). Human ecological survey in rural West Java in 1978 to 1982: a project report. Nissan Science Foundation, Tokyo. □
- Iskandar BS, Iskandar J, Irawan B, Partasasmita R. 2018. Traditional markets and diversity of edible plant trading: case study in Ujung Berung, Bandung, West Java, Indonesia. Biodiversitas 19 (2): 437-452.

- Iskandar J, Ellen R. 1999. In situ conservation of rice landraces among the Baduy of West Java. *J Ethnobiology* 19 (1): 97-125.
- Iskandar J, Iskandar BS, Pratasasmita R. 2018. Review: the impact of social and economic change on domesticated plant diversity with special reference to wet rice field and homegarden farming of West Java, Indonesia. *Biodiversitas* 19 (2): 502-514. □
- Iskandar J, Iskandar BS. 2011. Sundanese agroecosystem. Kiblat Buku Utama, Bandung [Indonesian].
- Iskandar J, Iskandar BS. 2013. Traditional agroforestry system based on bamboo plants plays an important role in supporting the socioeconomic population and environmental conservation in West Java. In: Kuswanto TS, Widyaningsih, Fauziyah E, Rachmawati R. (eds.). *Agroforestry for food and better environment*. Proceeding of agroforestry seminar, Malang, 21 May 2013 [Indonesian].
- Iskandar J. 2018. *Ethnobiology, ethnoecology, and sustainable development*. PT. Plantaxia, Yogyakarta. [Indonesian] □
- Istiadji RP, Fitria M, Larasati L, Meiyanto E. 2010. *Leunca (Solanum nigrum L.)* herbs ethanolic extract increase cytotoxic activity of cisplatin on heal cervical cancer cells. *Indon J Cancer Chemoprevent* 1 (2): 78-84.
- Karyono. 1981. *Structure of Homegardens in Village of Citarum River Basin*. [Dissertation]. Padjadjaran University, Sumedang. [Indonesian]
- Kurniawan M, Finesso GM, Wawa JE. 2018. The history of quinine was eroded from the Preanger stelsel. In: Wawa JE. (ed), *Citarum expedition: a million charms and issues of journalistic report of Kompas*. PT Gramedia, Jakarta. [Indonesian]
- Lizarralde M. 2004. Indigenous knowledge and conservation of the rainforest: Ethnobotany of the Bari of Venezuela. In: Carlson TJS, Maffi L. (eds.). *Ethnobotany and conservation of biocultural diversity*. The New York Botanical Garden Press, New York. □
- Marten GG, Abdoellah OS. 1988. Crop diversity and nutrition in West Java. *Ecol Food Nutr* 21: 17-43.
- Martin G J. 1995. *Ethnobotany: a method manual*. Chapman and Hall, London.
- Mustapa RHH. 1996. *Regarding Sundanese habits and other habits*. Published by Alumni, Bandung. [Indonesian].
- Newing H, Eagle CM, Puri RK, Watson CW. 2011. *Conducting research in conservation: a social science perspective*. Routledge, London.
- Nuryani N. 2002. *Adaptation Strategy of Farmers owning Talun to Economic Pressure: Case Study in Legokkole Hamlet, Karamat Mulya Village, Soreang Subdistrict, Bandung District*. [Hon. Thesis]. Anthropology Department, Padjadjaran University, Sumedang [Indonesian].
- Partasasmita R, Iskandar J, Rukmana PM. 2017. 'Naga people's (Tasikmalaya District, West Java, Indonesia) local knowledge of the variations and traditional management farm of village chickens. *Biodiversitas* 18 (2): 834-843.
- Putri LSE, Dasumiati, Kristiyanto, Mardiansyah, Malik C, Leuvinadrie LP, Mulyono EA. 2016. Ethnobotanical study of herbal medicine in Ranggawulung urban forest, Subang District, West Java, Indonesia. *Biodiversitas* 17 (1): 172-176. □
- Rumiyati L, Muna LN, Hidayati DN, Jenie RI. 2015. Acute toxicity and genotoxic activity of *leunca (Solanum nigrum L.)* herb ethanolic extract. *Indonesia J Cancer Chemoprevention* 6 (1): 30-34.
- Samuel J. 2015. Biodiversity of food species of the Solanaceae family: a preliminary taxonomic inventory of subfamily Solanoideae. *Resource* 4: 277-322. □
- Santosa E, Prawati U, Sobir, Mine Y, Sugiyama N. 2015. Agronomy, utilization and economics of indigenous vegetables in West Java, Indonesia. *J Hortikultura Indonesia* 6 (3): 125-134.
- Sarma H, Sarma A. 2011. *Solanum nigrum L.*, a nutraceutical enriched herb or invasive weeds? International Conference on Environment and BioScience IPCBEE 21. IACSIT Press, Singapore.
- Siemonsa JS, Grubben GJH. 1996. *Plant resources of South-East No.8, Vegetables*. Prosea, Bogor.
- Silalahi M, Nisyawati. 2018. The ethnobotanical study of edible and medicinal plants in the homegarden of Batak Karo sub-ethnic in North Sumatra, Indonesia. *Biodiversitas* 19 (1): 229-238.
- Soemarwoto O. 1987. *Homegardens: a traditional agroforestry system with a promising future*. In: Stepler HA, Nair PKR. (eds.) *Agroforestry: A Decade of Development*. International Council for Research in Agroforestry (ICRAF), Nairobi.
- Soetiarso TA. 2010a. Vegetable indigenous alternative with the high nutrition food source. *Iptek Hortikultura* 6: 5-10 [Indonesian].
- Soetiarso TA. 2010b. Consumer preference for the quality of attributes of four minor vegetables. *J Hortikultura* 20 (4): 398-407 [Indonesian]. □
- Suriawiria U. 2006. *Sundanese food*, in Rosidi A, Ekadjati ES, Alwasilah AC. (eds.). *Proceeding of International Conference of Cultural Sundanese*. Vol. 2. Yayasan Kebudayaan Rancage, Bandung. [Indonesian]
- van der Burg CL. 1904. *Nutrition in the Netherlands Indies*. JH de Bussy, Amsterdam. [Dutch]
- Withaningsih S, Andari CD, Parikesit, Fitriani N. 2018. The effect of understory plants on pollinators visitation in coffee plantations: Case study of coffee plantations in West Bandung District, West Java, Indonesia. *Biodiversitas* 19 (2): 604-612. □
- Wiyanti DT. 2016. *People and agroforestry (the use of non-commercial products from agroforestry)*. International Social Science, Humanity and Education Research Congress (SSHRC-16) July 20-21 Bali, Indonesia.
- Yurlisa K. 2016. The role of indigenous vegetable in household security in Indonesia. *J Ilmiah Hijau Cendekia* 1(2): 18-22. [Indonesian]