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RESEARCH ARTICLE

WILD EDIBLE PLANT RESOURCES OF TEA GARDENS IN TERAI AND HILLS OF DARJEELING DISTRICT IN WEST BENGAL, INDIA

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Abstract

A survey among the tea garden workers in Darjeeling Terai and Darjeeling Hills was conducted. Workers are mostly Santhals and Oraons (in Terai) and Nepalese (in Hills). The survey recorded 150 species of edible plants representing 63 families. This includes 18 species of monocots (covering 11 families) and 128 species of dicotyledons (covering 48 families) and 04 species of Pteridophytes from 04 families. Out of the recorded plants, 71 species are from Terai, 47 species from Hills and 32 species are common for Tea gardens of both the regions. Their traditional knowledge can be used for future food security of human races. At the same time proper awareness need to be generated among them as these plants might be contaminated with different types of chemicals used in such plantations. Scientific name, local name, habit, edible part and mode of use etc. of these plants have been presented and discussed.

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Introduction:-

Darjeeling is recognised worldwide for its unique naturally flavoured Tea and for the exquisite view of Mt. Kanchanjanga. Darjeeling is the northernmost district of the state of West Bengal, India, mostly spreading over the outer fringes of the Singalila Range of Eastern Himalaya and is covered by the IUCN recognized 'Himalaya Hotspot for Biodiversity Conservation'. Also, it is well known for its exceptionally rich biodiversity (Das 2004; Mittermeier *et al.* 2005; Das & Lungphi 2019). This entire region is located within 26° 31' 05" and 27° 13' 10" N latitude and between 87° 59' 30" and 88° 53' E longitude and is covering an altitudinal range from c. 132 m (at Matigara/Siliguri) to 3660 m Hills (at Sandakphu). It is bounded by Nepal and Purnea district of Bihar in the west, Sikkim and Bhutan in the north, Bhutan and Jalpaiguri district on East and the Uttar Dinajpur district on the South (Das 1995, 2004).

Topologically Darjeeling district is recognized into two broad divisions, Hills and Terai-plains. The landscape is characterized by many Hills of different elevations, narrow and steep V-shaped valleys with rivers and their innumerable tributaries (Das 1995, 2004; Basak *et al.* 2010). The southwardly rolling plains at the feet of Darjeeling Himalaya, administratively that comes under the Siliguri subdivision, is referred as Terai. The vegetation of the entire Eastern Himalayan region is highly diverse and rich and has invited plant lovers from round the world at least during the last three centuries (Hara 1966, 1971; Grierson & Long 1983; Das & Chanda 1987; Das 2004).

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The entire region, both Terai-plains and Darjeeling-Hills were earlier covered with almost continuous dense forests (Allen *et al.* 1906; Gurung 1911; Anonymous 2011) but during the last (20th) century, mainly with the fast extension of human settlements and construction of broad communication systems, the vegetation over the entire area has been degraded and depleted very fast (Sarkar 2008). This entire region is the home to numerous endemic, RET and botanically interesting species of plants. (Das 1996; Das *et al.* 2010; Das & Lungphi 2019). The abundance of medicinal plants in the flora of this part of the country is well known (Biswas & Chopra 1956; Rai *et al.* 1998; Rai & Bhujel 1999; Rai 2002; Das *et al.* 2010; Das & Lungphi 2019).

About 70 % area of this district is covered by tea gardens. There are enlisted **87** Tea Estates covering a total of 19,000 hectors of Hill area and 45 Tea Estates in Terai area located within this district [<https://www.darjeelingteaboutique.com/tea-gardens-of-darjeeling/>; <http://darjeeling.gov.in/tea-garden.html>; https://www.darjeeling-tourism.com/darj_0000bf.htm].

Before the establishment of Tea Gardens, the entire area was densely forest covered (Bhujel 1996). Entire Terai region and the Hills up to 2100 m altitude are now covered with almost continuous carpet of Tea Gardens. While the Hill-gardens generally cultivate cultivars of China variety [*Camellia sinensis* (L.) Kuntze var. *sinensis*], the gardens in Terai grow Assam variety [*Camellia sinensis* var. *assamica* (J.W. Mast.) Kitam,] cultivars (Das & Ghosh 2016; Kabir & Ghosh 2018).

Ghosh (2006) has recorded a very rich weed flora from the Tea Gardens of Terai and Darjeeling Hill regions. All these weeds are not just useless plants but are many of them are otherwise useful ones (Ghosh & Das 2011). These include many wild-edible, medicinal, fodder, potential ornamentals, etc. Many of these plants are regularly collected by the Tea Garden workers for their daily use and also for marketing (Ghosh 2006; Chettri *et al.* 2014). A considerable proportion of Tea Garden workers in this district are tribal people in general, mostly Santhals and Oraons in Terai and many Nepali communities in the Hill (Ghosh & Das 2004).

Present work was conducted in seven Tea Gardens/ Estates located in Terai and Hills within Darjeeling district and are located in very remote areas. The living standard of these tea garden workers are below the poverty level (Ghosh 2006). So, these poor people are forced to depend on many local wild plant resources for their sustenance and use a good number weedy wild plants in their daily diet. Among these, some plants are collected from tea gardens and some from the nearby natural vegetation (Ghosh & Das 2011).

Materials And Methods:-

Study area:

The present ethnobotanical survey was conducted among the tea garden workers of four Tea Estates from Terai and three Tea Estates of Hills in two phases, once during the years 2004 to 2006 and again during 2017 to 2018. These people include different traditional communities like Oraons and Santhals in Terai gardens and Nepali communities in Hill-gardens of Darjeeling District. The central altitude of these Tea Estates varies from ± 125 m. to ± 2010 m amsl. (Table 1; Figure-1)

Table 1:- Central geographical location and altitude of Tea Estates surveyed.

Gardens	Latitude	Longitude	Altitude
In Darjeeling-Terai			
Hansqua Tea Estate	26° 37' 784" N	88° 19' 068" E	± 125 m
Matigara Tea Estate	26° 42' 500" N	88° 22' 142" E	± 130 m
Kamalpur Tea Estate	26° 42' 341" N	88° 16' 428" E	± 154 m
Mohorgong & Gulma Tea Estate	26° 47' 203" N	88° 22' 866" E	± 168 m
In Darjeeling-Hills			
Makaibari Tea Estate	26° 62' 59" N	88° 16' 43" E	± 1100 m
Tumsung Tea Estate	27° 04' 590" N	88° 33' 723" E	± 1900 m
Soom Tea Estate	27° 02' 318" N	88° 09' 992" E	± 2010 m

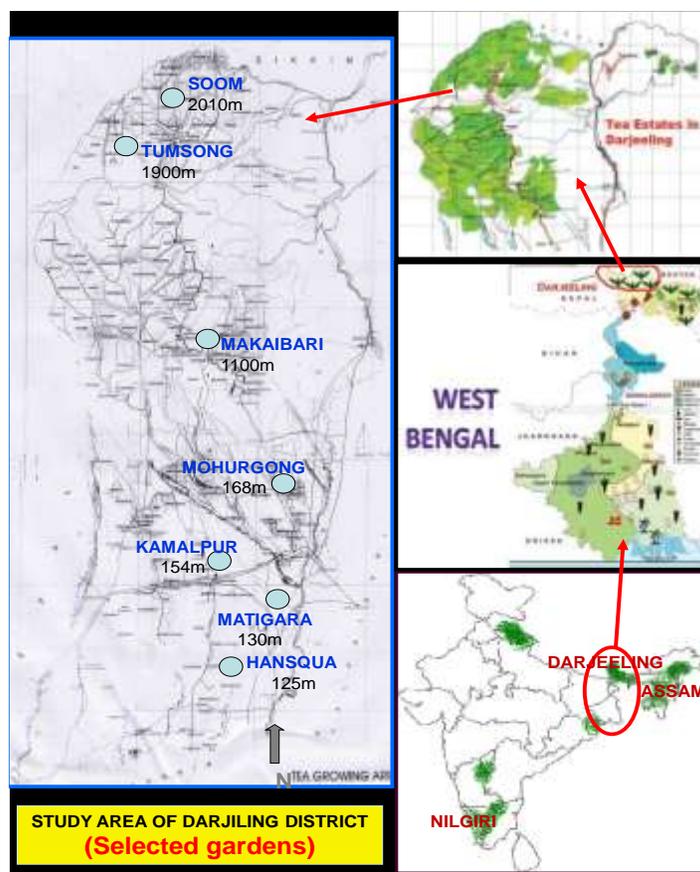


Figure 1:- Study Area.

Survey and Further Evaluation:

For the ethnobotanical survey the method was followed as adopted by Jain (1981, 1987, 1991) and Rai (2002). The mandatory PIC was taken from the local community-heads before start of the survey. A semi-structured questionnaire (Jain 1987; Tag 2007) was used for this purpose. All the voucher specimens were processed into mounted herbarium-sheets following Jain & Rao (1977). The plants were basically identified in the laboratory using different available floras (Grierson & Long 1983, 1987, 1991, 1994, 1999, 2001; Noltie 1994, 2000; Hara 1966, 1971; Hara *et al* 1978, 1979, 1982; Anonymous 1997, 2015, 2016) and were deposited in the Herbarium of the Department of Tea Science, University of North Bengal. For updated nomenclature and family delimitation www.plantsoftheworldonline.org and www.theplantlist.org were largely consulted.

Result and Discussion:-

Through the present ethnobotanical surveys as much as 150 species, representing 63 families, of edible plants used by the Tea Garden workers from Seven Tea Estates in Darjeeling District has been recognized and presented alphabetically in Table-2. Out of the collected edible plants, 71 species are from Terai-gardens, 47 plants are from Hill-gardens and 32 plants are common for both the regions of Darjeeling District. From Hill Tea Gardens comparatively lesser number of edible plant-species has been recorded to be eaten by Tea Garden workers.

Of the recorded edible plants, 18 are monocotyledonous (covering 11 families) and 128 species are dicotyledonous representing 48 families. In addition, four species of Pteridophytes (covering four genera from four families) were also recorded to be used as green vegetables and are namely *Diplazium esculentum*, *Pteridium aquilinum*, *Dryopteris filix-mas* and *Marsilea minuta* etc.

The current survey showed that a good number of herbaceous weeds of Tea gardens and some tree species from tea gardens and from surrounding natural vegetation tracts are collected by them to supplement their nutritional requirements. Fabaceae with 12 species is the most represented family and is followed by Moraceae (10 spp.),

Rutaceae (08 spp.), Amaranthaceae (07 spp.), Polygonaceae (06 spp.), Rubiaceae (06 spp.), Brassicaceae (05 spp.), etc. For habit groups, herbs (annual and perennial) are represented by 64 species and is the most important contributory. Then comes the trees (44 spp.), shrubs (20 spp.), climbers (22 spp.), etc are the other contributing habit groups (Figure-2).

Morphological diversity among the edible parts of the recorded plants is also quite interesting. Almost all normal morphological organs are edible, starting from root, passing through stem, leaf, inflorescence, flower, fruits, seed and a number of modified organs. In this study it was observed that fruits of 28 % species, leaves of 25 % specie and shoots of 21 % species has been selected or recognised by them as edible (Figure-3).

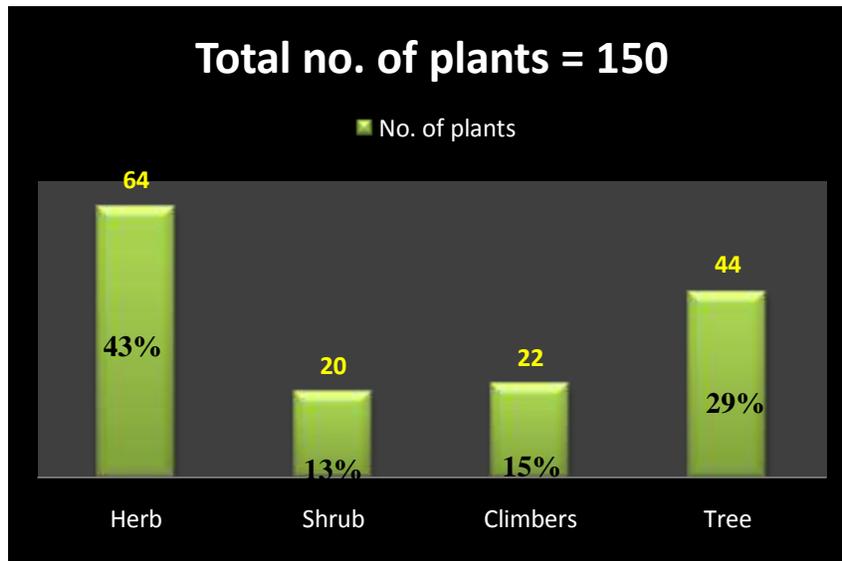


Figure 2:- Habit wise distribution of wild edible plants used by Tea garden workers in Terai & Hill of Darjeeling district.

It is quite interesting to note that they use even poisonous plants (Ghosh & Das 2011) for their some special types of preparations. For example, fruits and seeds of *Trichosanthes lepiniana*, quite a good number of nettle species like *Urtica ardens*, *Urtica dioica* and *Girardinia diversifolia* are managed by them to eat. Some of these plants are even marketed regularly.

The food value of most of these plants is unknown though the local people prepare quite tasty food using these species. Considering the taste, food value and preference some of these wild edible plants can be taken for proper cultivation and marketing (Ghosh 2015).

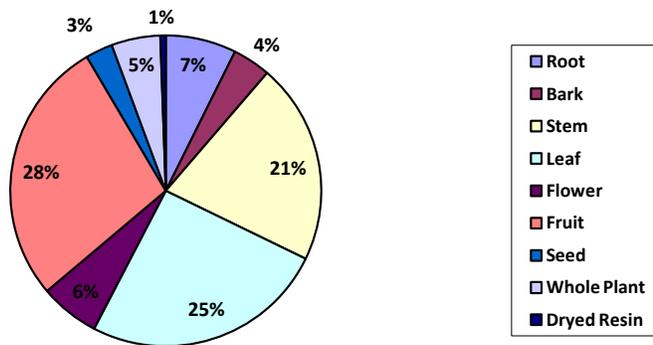


Figure 3:- Percentage of different plant parts used by Tea garden workers in Terai & Hill of Darjeeling district.

They make some special preparation also. Common fermented foods like *Sinki* and *Gundruk* using locally available plants and used those during the periods of scarcity. *Jhara* (Oraons) or *Harhia* (Santhals), the rice beer, is extremely popular among the tribal people specially among the Oraon & Santhals communities. They use many weedy plants for its preparation (Ghosh & Das 2004). It is consumed during all of their festivals and ceremonies, marriages and on holidays regularly. - - There are at least thirteen species of plants used for its preparation. These are *Oryza sativa*, *Coccinia grandis*, *Cyanthillium cinereum*, *Clerodendrum infortunatum*, *Plumbago zeylanica*, *Stephania japonica*, *Stephania rotunda*, *Oroxylum indicum*, *Mussaenda roxburghii*, *Scoparia dulcis*, *Rauwolfia serpentina*, *Artocarpus heterophyllus*, and *Wattakaka volubilis*.

These tough but poor-people generally live in remote villages or in poorly developed colonies in or around Tea Gardens but maintain a large number of traditional cultural practices. After whole day's struggle for the collection of livelihood they need some entertainment. So, they drink rice beer in good amount and start enjoying (Ghosh & Das 2004). While rice-beer is popular in Terai-Duars region, in Hills millet-beer is used abundantly. It is made from the grains of *Eleusine coracana* and locally called *Jnard* or *Tongba* or *Chhyang* (Tamang *et al.* 1988). However, finger-millet can be cooked and taken as alternatives to wheat or rice. The plant is widely cultivated in subtropical and warm-temperate hills of Darjeeling.

Table 2:- List of common edible plants by Tea garden workers in Terai & Hills region of Darjeeling along with their local name, habit, edible part and mode of use.

[**Abbreviations used:** Habit: HA = Annual Herb; HG = Geophytic Herb; HP = Perennial Herb; CA = Annual Climber; CG = Geophytic Climber; Cr = Creeper; CS = Shrubby Climber; L = Liana; R = Runner; Sf = Suffrutescent; S = Shrub; T = Tree

Garden location: T= Terai, H=Hills, NK = Not Known

Plant part: Bk = Bark, Brw = Brewing, Fl = Flower, Fr = Fruit, Infl = Inflorescence, Lf = Leaf, Rt = Root, Rhz = Rhizome, Sd = Seed, Sht = Shoot, St = Stem, Tg = Twig, WP = Whole Plant, YS = Young shoot]

Scientific Name [Family]	Local Name	Habit	Gardens	Edible part	Mode of use
<i>Abroma augustum</i> (L.) L.f. [Malvaceae]	<i>Sano kipasi</i>	S	H	Sd	Edible
<i>Acmella calva</i> (DC.) R.K.Jansen [Asteraceae]	<i>Jangjurbi</i>	HA	T	Yng Tg	Green vegetable
<i>Actinidia strigosa</i> Hook.f. & Thomson [Actinidiaceae]	NK	CS	H	Fr	Raw; brewing
<i>Adenanthera pavonina</i> L. [Fabaceae]	<i>Reti</i>	T	T	Fr	Vegetable
<i>Aegle marmelos</i> (L.) Corrêa [Rutaceae]	<i>Bael, Bel</i>	T	T	Ripe Fr	Raw
<i>Alocasia macrorrhizos</i> (L.) G.Don [Araceae]	<i>Mankachhu</i>	HP	T	Lf, St	Vegetable
<i>Alternanthera paronychioides</i> A.St.-Hil. [Amaranthaceae]	<i>Sanchi</i>	HA	T	Sht	Green vegetable
<i>Alternanthera sessilis</i> (L.) R.Br. ex DC. [Amaranthaceae]	<i>Gudru saag, Nunia saag</i>	HA	T	YS	Green vegetable
<i>Amaranthus blitum</i> L. [Amaranthaceae]	<i>Lal bhaji</i>	HA	T	YS	Green vegetable
<i>Amaranthus spinosus</i> L. [Amaranthaceae]	<i>Kata bhaji</i>	HA	T	YS	Green vegetable

<i>Amaranthus viridis</i> L. [Amaranthaceae]	<i>Khudi bhaji</i>	HA	T	YS	Green vegetable
<i>Ammannia baccifera</i> L. [Lythraceae]	<i>Amber</i>	HA	T	Lf	Green vegetable
<i>Amorphophallus paeoniifolius</i> (De nst.) Nicolson [Araceae]	<i>Bon-Oll</i>	HG	T	Tuber, Lf	Green vegetable
<i>Annona reticulata</i> L. [Annonaceae]	<i>Nona</i>	T	T	Fr	Ripe ones taken raw
<i>Annona squamosa</i> L. [Annonaceae]	<i>Ata</i>	T	T	Ripe Fr	Ripe ones taken raw
<i>Antidesma acidum</i> Retz. [Phyllanthaceae]	<i>Archal</i>	S	H	Lf, green & ripe Fr	Cooked or raw
<i>Ardisia solanacea</i> Roxb. [Primulaceae]	<i>Damai phal</i>	S	H	Ripe Fr	Raw
<i>Artocarpus heterophyllus</i> Lam. [Moraceae]	<i>Rukh (H)kathar, Kathal(T,H)</i>	T	T,H	Fr, Sd(T,H) Lf(T)	Cooked, raw(H) Brewing, Fruit vegetable(T)
<i>Artocarpus lacucha</i> Buch.-Ham. [Moraceae]	<i>Dahua, Dewa, Borhar</i>	T	T	Ripe Fr	Raw
<i>Azadirachta indica</i> A.Juss. [Meliaceae]	<i>Neem</i>	T	T	Lf, Fr, Bk	Bitter vegetable
<i>Bacopa monnieri</i> (L.) Wettst. [Plantaginaceae]	<i>Brahmi</i>	HP	T	Yng Sht	Green vegetable
<i>Bauhinia purpurea</i> L. [Fabaceae]	<i>Kochnar, Koirala (T), Taki (H)</i>	T	T,H	Fl bud	Vegetable
<i>Bauhinia variegata</i> L. [Fabaceae]	<i>Tanki</i>	T	T,H	Fl bud (T), Yng Sht, bud, Fl (H)	Cooked as vegetable
<i>Boerhavia coccinea</i> Mill. [Nyctaginaceae]	<i>Khapra saag</i>	HA	T	WP	Vegetable
<i>Brassica juncea</i> (L.) Czern. [Brassicaceae]	<i>Rye saag(T) Rayo saag(H)</i>	HA	T,H	Yng Sht(T) Tender Lf & Sht(H)	Vegetable (T,H), <i>Gundruk</i> (a fermented food) from dried and mature leaves (H)
<i>Brassica rapa</i> L. [Brassicaceae]	<i>Sarisa</i>	HA	T	Lf, Sd	Green vegetable, condiment
<i>Cajanus cajan</i> (L.) Huth [Fabaceae]	<i>Arhar</i>	S	T	Sd	Fd
<i>Calamus erectus</i> Roxb. [Arecaceae]	<i>Bet</i>	L	H	Ripe Fr	Raw
<i>Camellia sinensis</i> (L.) Kuntze [Theaceae]	<i>Chia, Chha</i>	T	T, H	Fl, Lf	Cooked. Beverage
<i>Canna indica</i> L. [Cannaceae]	<i>Phul tarul</i>	HG	H	Rhz	Cooked

<i>Cardamine hirsuta</i> L. [Brassicaceae]	NK	HA	H	Sht	Green vegetable
<i>Carica papaya</i> L. [Caricaceae]	Pepe, Mewa	T	T,H	Yng & ripe Fr	Cooked & raw
<i>Catunaregam longispina</i> (Link) Tirveng. [Rubiaceae]	Maidalu, Kankra Jat	T	T	Lf	Green vegetable
<i>Centella asiatica</i> (L.) Urb. [Apiaceae]	Beng saag	HA	T	WP	Green vegetable
<i>Chenopodium album</i> L. [Amaranthaceae]	Bhatua saag	HA	T,H	YS	Green vegetable
<i>Choerospondias axillaris</i> (Roxb.) B.L.Burt & A.W.Hill [Anacardiaceae]	Lapsi	T	H	Fr	Ripe & green raw; pickles
<i>Cinnamomum tamala</i> (Buch.-Ham.) T.Nees & C.H.Eberm. [Lauraceae]	Tejpatta	T	T,H	Bk, Lf	Flavouring spices
<i>Cinnamomum bejolghota</i> (Buch.-Ham.) Sweet [Lauraceae]	Bhale sinkowli	T	H	Bk of St & Rt	Flavouring spices
<i>Citrus × aurantiifolia</i> (Christm.) Swingle [Rutaceae]	Suntala	T	T,H	Ripe Fr	Raw
<i>Citrus maxima</i> (Burm.) Merr. [Rutaceae]	Bimbira (T), Sankatra (H)	T	T,H	Fr(T), Ripe Fr(H)	Raw
<i>Citrus medica</i> L. [Rutaceae]	Nimbu	S	T,H	Fr	Raw
<i>Clerodendrum infortunatum</i> L. [Lamiaceae]	Ghato, Vhauti	Sf	T	Yng Lf	Brewing, vegetable
<i>Coccinia grandis</i> (L.) Voigt [Cucurbitaceae]	Janglikundr, Telakuch	CS	T,H	Leafy Tg, Fr,	Green vegetable, Brewing
<i>Coix lacryma-jobi</i> L. [Poaceae]	Ghanrey mala	HA	T	Mature grains	Like wheat
<i>Colocasia esculenta</i> (L.) Schott [Araceae]	Kalo kachhu	HG	T	Lf, Rhz	Green vegetable
<i>Commelina benghalensis</i> L. [Commelinaceae]	Kana saag	HA	T	Yng Sht	Green vegetable
<i>Coriandrum sativum</i> L. [Apiaceae]	Dhaniya	HA	T, H	Lf, Infl, Fr	Salads, sauces, pickle, spice
<i>Crotalaria juncea</i> L. [Fabaceae]	Sanaiful	HA	T	Yng Sht	Green vegetable
<i>Cucumis melo</i> L. [Cucurbitaceae]	Gomra, Dhundhul	CS	T,H	Leafy Tg, Fr	Vegetable
<i>Cyanthillium cinereum</i> (L.) H.Rob. [Asteraceae]	Chhepra, Jurbula	HA	T	Semi-tuberous Rt	Brewing
<i>Deeringia amaranthoides</i> (Lam.) Merr. [Amaranthaceae]	Chhonra-chhunri saag (T) Bakri sag (H)	CS	T,H	YS, Lf	Green vegetable
<i>Dillenia indica</i> L. [Dilleniaceae]	Chalta (T), Panchphal, Mechiaphal	T	T,H	Persistent calyx(T), Pseudocarp(Vegetable(T), Cooked(H)

	((H)			H)	
<i>Dioscorea alata</i> L. [Dioscoreaceae]	Arukanda, Nappakanda, Gethikanda, Toral	CG	T	Rhz	Vegetable
<i>Dioscorea belophylla</i> (Prain) Voigt ex Haines [Dioscoreaceae]	Ghita torul	CG	H	Yam	Cooked
<i>Dioscorea bulbifera</i> L. [Dioscoreaceae]	Bantarul	CG	T	Rhz	Vegetable
<i>Dioscorea pentaphylla</i> L. [Dioscoreaceae]	Rani bhyagur	CG	H	Yam	Cooked
<i>Diplazium esculentum</i> (Retz.) Sw. [Aspleniaceae]	Dhenki saag (T) Kukri saag(T) Ningro(H)	HP	T,H	Yng fronds	Green vegetable
<i>Dryopteris filix-mas</i> (L.) Schott [Polypodiaceae]	NK	HP	T	Yng frond	Green vegetable
<i>Elaeocarpus lanceifolius</i> Roxb. [Elaeocarpaceae]	Bhadrasey	T	H	Fr	Raw
<i>Eleusine coracana</i> (L.) Gaertn. [Poaceae]	Kodo, Mong	HA	H	Fr	Brewing, cooked
<i>Enydra fluctuans</i> Lour. [Asteraceae]	Hinche saag	HP	T	Yng Sht	Green vegetable
<i>Eryngium foetidum</i> L. [Apiaceae]	Bhote dhania	HA	T,H	Lf	Flavouring spices, salads, sauces
<i>Fagopyrum cymosum</i> (Trevir.) Meisn. [Polygonaceae]	Fapar	HA	H	Sht	Green vegetable
<i>Ficus auriculata</i> Lour. [Moraceae]	Nevaro	T	T	Figs	Young: cooked; Ripe: eaten raw
<i>Ficus benghalensis</i> L. [Moraceae]	Bor	T	H	Ripe fig	Raw
<i>Ficus benjamina</i> L. [Moraceae]	Kabra	T	H	Yng Sht, Lf bud	Cooked & raw
<i>Ficus hispida</i> L.f. [Moraceae]	Dumur, Koksa	T	T,H	Lf, Fr	Green vegetable
<i>Ficus neriifolia</i> Sm. [Moraceae]	Dudhila	T	H	Leaf-bud	Green vegetable
<i>Ficus racemosa</i> L. [Moraceae]	Dumri	T	T	Figs	Young: cooked; Ripe: eaten raw
<i>Ficus semicordata</i> Buch.-Ham. ex Sm. [Moraceae]	Khanium	T	T,H	Figs	Ripe: eaten raw
<i>Girardinia diversifolia</i> (Link) Friis [Urticaceae]	Vangrey sishnu	S	H	Yng sht	Green vegetable
<i>Glinus oppositifolius</i> (L.) Aug.DC. [Molluginaceae]	Gima saag, Deila saag	HA	T	WP	Green vegetable
<i>Hellenia speciosa</i> (J.Koenig)			T, H		Green

S.R.Dutta [Costaceae]	<i>Kemuk, Betlawre (T), Bet lauree (H)</i>	HG		Yng Lf(T) Rhzh(H)	vegetable(T), Cooked(H)
<i>Holographis hintonii</i> (Leonard) T.F.Daniel [Acanthaceae]	<i>Pakhan bet</i>	HP	H	Fl	Pickles
<i>Houttuynia cordata</i> Thunb. [Saururaceae]	<i>Gandey jhar</i>	HP	H	Yng Sht	Green vegetable
<i>Hygrophila auriculata</i> (Schumach.) Heine [Acanthaceae]	<i>Kulekhara</i>	Sf	T	YS	Green vegetable
<i>Indocypraea montana</i> (Blume) Orchard [Asteraceae]	<i>Bhringaraj</i>	HP	T	Leafy Tg	Green vegetable
<i>Ipomoea aquatica</i> Forssk. [Convolvulaceae]	<i>Kalmi saag</i>	Cr	T	Yng Sht	Green vegetable
<i>Justicia adhatoda</i> L. [Acanthaceae]	<i>Asuro</i>	S	H	Infl	Cooked as vegetable
<i>Koenigia mollis</i> (D.Don) T.M.Schust. & Reveal [Polygonaceae]	<i>Thotne</i>	S	H	Soft St	Raw & cooked
<i>Lantana camara</i> L. [Verbenaceae]	<i>Kuttush, Putush kata</i>	S	T	Fr, Bk	Raw
<i>Leucas zeylanica</i> (L.)W.T.Aiton [Lamiaceae]	<i>Guma saag</i>	HA	T	Fl, Sht	Green vegetable
<i>Litsea cubeba</i> (Lour.) Pers. [Lauraceae]	<i>Siltimbur</i>	T	H	Fr	Raw, pickles
<i>Malva verticillata</i> L. [Malvaceae]	<i>Laffa saag</i>	HA	T	Sht	Green vegetable
<i>Manihot esculenta</i> Crantz [Euphorbiaceae]	<i>Simal tarul, Tapioca</i>	S	H	Tuberous Rt	Sauces, pickles, mocha for brewing. Sometimes staple diet
<i>Marsilea minuta</i> L. [Marsileaceae]	<i>Susni</i>	HA	T	Lf	Green vegetable
<i>Melastoma malabathricum</i> L. [Melastomataceae]	<i>Datrangi</i>	S	T	Ripe Fr	Raw
<i>Melochia corchorifolia</i> L. [Malvaceae]	<i>NK</i>	HA	T	Yng Sht	Green vegetable
<i>Mentha arvensis</i> L. [Lamiaceae]	<i>Pudina</i>	HP	T	WP, Lf	Aromatic food additive
<i>Mimusops acutifolia</i> Mildbr. [Sapotaceae]	<i>Bakul</i>	T	T	Ripe Fr	Raw
<i>Momordica dioica</i> Roxb. ex Willd. [Cucurbitaceae]	<i>Chetheli, Ban karela</i>	CG	T	Green Fr	Fruit vegetable
<i>Morus indica</i> L. [Moraceae]	<i>Sano kimbu</i>	S	H	Ripe Fr	Raw
<i>Mucuna pruriens</i> (L.) DC. [Fabaceae]	<i>Hiunde simi</i>	CA	H	Sd	Substitute of dal (pulses)
<i>Musa balbisiana</i> Colla [Musaceae]	<i>Ban-kera</i>	HP	H	Infl, green & ripe Fr, stem inside Lf sheaths	Vegetable; ripe fruits taken raw
<i>Mussaenda roxburghii</i> Hook.f.			T		Brewing,

[Rubiaceae]	<i>Katmatiya, Dhobi Kat</i>	S		Yng Sht	Green vegetable
<i>Nasturtium officinale</i> W.T.Aiton [Brassicaceae]	<i>Simrayo</i>	HA	H	Sht	Green vegetable
<i>Neolamarckia cadamba</i> (Roxb.) Bosser [Rubiaceae]	<i>Kadam</i>	T	T	Ripe Fr	Raw
<i>Oldenlandia corymbosa</i> L. [Rubiaceae]	<i>Atisar, Khetpapra</i>	HA	T	WP	Green vegetable
<i>Oroxylum indicum</i> (L.) Kurz [Bignoniaceae]	<i>Totola (T,H) Taloyar, Dakdewa (T)</i>	T	T,H	Bk(T) Fl(H)	Brewing(T) Vegetable(H)
<i>Ostodes paniculata</i> Blume [Euphorbiaceae]	<i>Bepari</i>	T	H	Lf	Roti Prepared in leaves add special flavour and taste during different festivals in Nepalese
<i>Oxalis debilis</i> Kunth [Oxalidaceae]	<i>Pani kandi</i>	HG	T	Bulb	Vegetable
<i>Oxalis corniculata</i> L. [Oxalidaceae]	<i>Khatta saag, Amruli saag, Amarchingari (T), Chariamilo (H)</i>	HA	T,H	WP	Green vegetable (sour)
<i>Paederia foetida</i> L. [Rubiaceae]	<i>Padrilarang, Gandhabhadali</i>	CS	T	Lf	Green vegetable
<i>Pandanus furcatus</i> Roxb. [Pandaneaceae]	<i>NK</i>	T	H	Ripe Fr	Raw
<i>Passiflora edulis</i> Sims [Passifloraceae]	<i>Garendal</i>	CS	H	Ripe Fr	Raw
<i>Passiflora foetida</i> L. [Passifloraceae]	<i>NK</i>	CA	T	Ripe fr	Raw
<i>Persicaria chinensis</i> (L.) H. Gross [Polygonaceae]	<i>NK</i>	HP	H	Yng Sht	Raw
<i>Persicaria hydropiper</i> (L.) Delarbre [Polygonaceae]	<i>Kusurpota, Sukurpota</i>	HA	T	Lf	Green vegetable
<i>Phlogacanthus thyriformis</i> (Roxb. ex Hardw.) Mabb. [Acanthaceae]	<i>Rambasak, Chuwa</i>	S	H	Infl	Vegetable
<i>Phyllanthus emblica</i> L. [Phyllanthaceae]	<i>Amloki</i>	T	H	Fr	Raw
<i>Piper abalienatum</i> Trel. [Piperaceae]	<i>Chava paan</i>	CS	H	Lf, St	Masticatory; stem as spice
<i>Piper pedicellatum</i> C.DC. [Piperaceae]	<i>Bhotey Paan</i>	CS	T	Lf	Masticatory
<i>Plumbago zeylanica</i> L. [Plumbaginaceae]	<i>Chetoar, Chitawar</i>	S	T	Leafy Tg	Brewing
<i>Polygonum plebeium</i> R.Br. [Polygonaceae]	<i>Chimti saag</i>	HA	T	WP	Green vegetable
<i>Potentilla indica</i> (Andrews)		HA	T,H	Fr	Eaten raw

Th.Wolf [Rosaceae]					
<i>Portulaca oleracea</i> L. [Portulacaceae]	NK	HA	T	WP	Green vegetable
<i>Prunus cerasoides</i> Buch.-Ham. ex D.Don [Rosaceae]	Painyun	T	H	Ripe Fr	Raw
<i>Psidium guajava</i> L. [Myrtaceae]	Ambak	T	T,H	Ripe Fr	Raw
<i>Pteridium aquilinum</i> (L.) Kuhn [Dennstaedtiaceae]	NK	HP	T	Yng frond	Green vegetable
<i>Punica granatum</i> L. [Lythraceae]	Darim, Anar	S	T, H	Ripe Fr	Raw
<i>Raphanus raphanistrum subsp. sativus</i> (L.) Domin [Brassicaceae]	Mula	HA	T,H	Fresh root tuber, Lf	Vegetable. Sinki a traditional fermented food prepared from matured dry leaves and dried root tuber
<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz [Apocynaceae]	Nagbeli	HP	T	Bk of Rt, Rt	Brewing
<i>Rumex nepalensis</i> Spreng. [Polygonaceae]	Halhale	HA	H	Lf	Green vegetable
<i>Schnella accrescens</i> (Killip & J.F.Macbr.) Trethowan & R.Clark [Fabaceae]	Koiralo	T	H	Yng Sht, bud, Fl	Cooked as vegetable
<i>Scleromitron diffusum</i> (Willd.) R.J.Wang [Rubiaceae]	Atisar	HA	T	WP	Green vegetable
<i>Scoparia dulcis</i> L. [Plantaginaceae]	Atibala, Mitha, Jangli Dhania, Ghuma, Darchetowar	Sf	T	Leafy Tg	Brewing
<i>Senegalia catechu</i> (L.f.) P.J.H.Hurter & Mabb. [Fabaceae]	Khayer	T	T,H	Dryed resin (Khayer)	Chewing with betel leaf
<i>Senna occidentalis</i> (L.) Link [Fabaceae]	Tapray, Kalkasunda	HA	T	Lf	Green vegetable
<i>Senna tora</i> (L.) Roxb. [Fabaceae]	Chhoto chakar	HA	T	Lf	Green vegetable
<i>Sesbania grandiflora</i> (L.) Pers. [Fabaceae]	Bagphul, Bokphul	T	T	Fl	Vegetable
<i>Sesbania sesban</i> (L.) Merr. [Fabaceae]	Jayanti	S	T	Leafy Tg	Green vegetable
<i>Solanum nigrum</i> L. [Solanaceae]	Pako saag	HA	T	Yng Tg, ripe Fr	Green vegetable; raw by children
<i>Solanum torvum</i> Sw. [Solanaceae]	Goth Begun, Pako saag	S	T	Yng Fr	Fruit vegetable
<i>Stellaria media</i> (L.) Vill. [Caryophyllaceae]	Armaley Jhaar	HA	H	Sht	Green vegetable
<i>Stellaria wallichiana</i> Haines [Caryophyllaceae]	Armaley Jhaar	HA	T	Sht	Green vegetable
<i>Stephania rotunda</i> Lour. [Menispermaceae]	Inderparhi, Parhi, Karaiya	CG	T	Rt Tuber	Brewing
<i>Stephania japonica</i> (Thunb.) Miers	Inderparhi,	CS	T		Brewing

[Menispermaceae]	<i>Parhi, Karaiya</i>			Rt Tuber	
<i>Terminalia bellirica</i> (Gaertn.) Roxb. [Combretaceae]	<i>Barra</i>	T	T,H	Fr kernel, cotyledons	Raw
<i>Terminalia chebula</i> Retz. [Combretaceae]	<i>Harra</i>	T	T,H	Fr kernel	Raw
<i>Tetradium fraxinifolium</i> (Hook.) T.G.Hartley [Rutaceae]	<i>Khanakpa</i>	T	H	Fr	Pickles
<i>Tetrataenium nepalense</i> (D.Don) Manden. [Apiaceae]	<i>Chimping</i>	HA	H	Fr	Pickles, aromatic spice
<i>Toddalia asiatica</i> (L.) Lam. [Rutaceae]	<i>Singane kanra</i>	CS	H	Ripe Fr	Raw
<i>Trichosanthes lepiniana</i> (Naudin) Cogn. [Cucurbitaceae]	<i>Kowa tumbil (T) Indraynee, Indrenee (H)</i>	L	T,H	Yng Fr(T), Sd(H)	Fruit vegetable(T) Roasted(H)
<i>Urtica dioica</i> L. [Urticaceae]	<i>Patle sisnu</i>	S	H	Yng infl	Cooked
<i>Urtica ardens</i> Link [Urticaceae]	<i>Sisnu, Ghariya sisnu</i>	S	H	Yng infl	Cooked
<i>Wattakaka volubilis</i> (L.f.) Stapf [Apocynaceae]	<i>Chhit larang</i>	L	T	St Bk	Brewing
<i>Zanthoxylum nitidum</i> (Roxb.) DC. [Rutaceae]	<i>Parpare Timbur</i>	T	H	Fr	Raw, pickles, sauces
<i>Zanthoxylum oxyphyllum</i> Edgew. [Rutaceae]	<i>Bhainsi Timbur</i>	T	H	Fr	Raw, pickles, sauces
<i>Zingiber officinale</i> Roscoe [Zingiberaceae]	<i>Aduwa</i>	HG	H	Rhz	Sauces, pickles, spices, flavouring agent
<i>Ziziphus jujuba</i> Mill. [Rhamnaceae]	<i>Baer(T,H), Kul</i>	T	T,H	Fr	Raw(T,H), pickles



Oroxylum indicum



Hygrophila auriculata



Phlogacanthus thyriformis



Enydra fluctuans



Coccinia grandis



Houttuynia cordata



Hellenia speciosa



Marsilea minuta



Bacopa monnieri

Figure 4:- Some Wild Edible Plants used by Tea garden workers in Terai and Hill of Darjeeling District.

Conclusion:-

The culture of Santhal and Oraon tribes are different from each other. On the other hand, Nepalese workers produce the main work-force in Hill gardens. The present survey among the Tea Garden workers in Terai and Hills of Darjeeling District has resulted in the record of large number of edible plants and their different types of uses. A scan through the list exposed the diversity within these plants and includes Dicotyledonous, Monocotyledonous and Pteridophytic plants.

Poor Tea Garden workers collect many of these plants from the gardens itself. That means, apart from their daily wages, they also get many edible plants from these gardens. But, how far these plants are safe to consume - that's a big question! How much of the pesticides and other chemicals regularly dumped in these tea gardens regularly are retained in these weeds is unknown.

Plants collected outside the garden area, mostly the natural vegetation must be safer and dependable. However, many of these listed plants are regularly marketed or even cultivated. So, non-cultivated but marketable plants could fetch some fund regularly, round the year for their better sustenance!!! At the same time, some awareness program related to the food safety need to conduct among these people regularly.

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