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Wild Edible Plants of Dhankuta, Eastern Nepal

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Abstract

The Dhankuta district, situated in the Eastern part of the country, is a hot spot for floral diversity. The vegetation zone ranges from sub tropical Sal forest to cool temperate alpine forest. The study of wild edible plant of this area was an attempt to highlight the types of wild edible plants found and their mode of use in local people. Present study records 132 species of wild edible plants belonging to 63 families and 103 genera. Fruits are the most common edible parts of the wild edible plants followed by leaves, young shoot, root or tuber, seeds, flower, whole plants, bark, nectar, nuts, inflorescence and buds.

Key words: wild edible plants, Dhankuta, eastern, agro-ecological

Introduction

Nepal is endowed with a wide range of agro-ecological zones, large variation in climatic and physiographic conditions, which have resulted in a rich flora (Olsen 1998). Although Nepal covers less than 0.1% of the earth's land area, it is disproportionately a species rich country. Current estimates of species number indicate that there are 465 species of lichens, 1822 species of fungi, 1001 species of algae, 1,150 species of bryophytes, 534 species of pteridophytes, 26 species of gymnosperms and 6,973 species of angiosperms (Chaudhary et al. 2016). Nepal's diverse climatic conditions harbors 118 ecosystems, 35 forest types, 75 vegetation types and about 7000 vascular plants (Jha 1992). The people generally depend on nearby forest areas to supply their needs. The biological resources are used in many ways: such as timber, fuel wood, food, wild vegetables, spices, wild fruits, and often important medicines. Among them, wild edible plants play a major role in supplying food for poor communities in many rural parts of the world. Wild plants, aside from being used by poor communities, are commonly used today as a supplement for healthy diets in even the most developed

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regions of the world (Redzic 2006). Approximately 75,000 species of plants world-wide are believed to be edible (Walters & Hamilton 1993). It has even been suggested that wild food plants are nutritionally superior to some of the cultivated ones (Burlingame 2000). However, these plant resources and their indigenous use are in danger of being lost in areas where environmental and cultural transformations have led to changes in feeding practices (Acharya & Acharya 2010).

Wild edible plants provide staple and supplement foods, as well as cash income to local communities, thus favoring food security. However, wild edible plants are largely ignored in land use planning and implementation, economic development, and biodiversity conservation. Moreover, wild edible plants related traditional knowledge is rapidly eroding (Malla et al. 1982). The Dhankuta district is equipped with a wide range of agro-ecological zones and most of the people of Dhankuta inhabit in rural areas and are farmers. These people are blessed with a deep knowledge concerning the use of wild plants which are consumed at times of drought and other hardship. Elders and other knowledgeable community members are the key source of plant use. Therefore forest resources play an important role in the daily life of people for their food, medicine, fodder, fuel etc. The reason to initiate a study on wild edible plants was to document the local knowledge on wild foods to identify and understand the better importance of wild food in livelihood of the rural people of the district.

Methods and Materials

Study area

Dhankuta is situated between 26^0 53' N latitude to 27^0 19' N latitude and 87^0 8' E longitude to 87^0 33' E longitude. The total area of Dhankuta district is about 191.1 km^2, with narrower northern part and wider southern part. Ilam, Terhathum and Pachthar districts are located on the eastern part of the district; Bhojpur, Udayapur districts on the western part; Sankhuwasabha on the northern part and Morang and Sunsari on the southern part of the Dhankuta district. The elevation ranges from 180 m to 3000 m above sea level (DDC 2010). The average temperature in Dhanuta is 20. 6 ^{0}C and the annual rainfall is 1002 mm. The vegetation zones in the district range from sub-tropical Sal forest along the Tamor and Arun rivers, and cool temperate forests on some of the high ridges that mark the watershed between the two catchments (Shrestha 2020).

Methods

The present study was based on secondary data collected from stranded literature and online journal like, Malla, et al. 1982, Panta & Dhami, 2005, Acharya 2010, Ghimeray et al. 2010, Dangol et al. 2017. The availability and uses of the plants were confirmed by questionnaire asked to local and elder people of the district.

Results and Discussion

From the present study it has been revealed that the Dhankuta district is rich in wild edible plant. The study in the district documented about 132 varieties of wild edible plants belonging to 63 families and 103 genera. Of the total families, the most dominating family is Leguminosae and Moraceae with 9 species each, followed by Polygonaceae and Rosaceae (7 species), Anacardiaceae (6 species), Poaceae (5 species), Cucurbitaceae (4 species), Apiaceae and Araceae (3 species) and remaining families contain less than 3 species. Out of the total genera, the largest is *Dioscorea* and *Ficus* containing 5 species each, followed by *Bauhinia, Fagopyrum* and *Zizipus* containing 3 species each and remaining genera contain less than 3 species. Table 1 shows the detail of commonly available wild edible plants of Dhankuta.

Table 1: List of wild edible plants found in Dhankuta district

S.N	Species	Local Name	Family	Parts	Uses
1	*Acacia catechu* (L.f.)Willd	Khayar	Leguminosae	Bark, wood	Tea
2	*Aegle marmelos* (L.) Correa	Bel	Rutaceae	Fruits	Fruits
3	*Amaranthus caudatus* L	Latte sag	Amaranthaceae	Leaves	Vegetable
4	*Amaranthus spinosus* L.	Ban lunde	Amaranthaceae	Leaves	Vegetable
5	*Aralia leschenaultia* (DC.) J.Wen	Chinde	Araliaceae	Leaves	Vegetable
6	*Arisaema jacquemontill* Blume	Sarpa ko Makai	Araceae	Root/tuber	Vegetable
7	*Arisaema tortuosum* (Wall.) Schott	Banko	Araceae	Root/tuber	Vegetable
8	*Artocarpus heterophyllus* Lam	Katahar	Moraceae	Fruits	Fruits
9	*Artocarpus lacucha* Buch. – Hem.	Badahar	Moraceae	Fruits	Fruits
10	*Asparagus filicinus* Buch.-Ham. Ex D. don	Ban kurilo	Aspracaceae	Shoots	Vegetable
11	*Asparagus racemosus* willd	Kurilo	Asparagaeae	Young shoots	Vegetable
12	*Bambusa arundinaceae* willd.	Bans	Poaceae	Young shoots	Vegetable
13	*Bambusa nepalensis* Stapleton	Choya bans	Poaceae	Young shoots	Vegetable
14	*Bauhinia purpurea* L.	Tanki	Leguminosae	Flower, young leaves	Pickle, vegetable
15	*Bauhinia vahlii* weght & Arn	Bharlo	Leguminosae	Seeds	Vegetable, fruits
16	*Bauhinia variegate* L.	Koiralo	Leguminosae	Buds, flower, leaves	Pickle, vegetable
17	*Begonia longifolia* Blume	Magarkachey	Bignoniaceae	Shoots, leaves	Vegetable

18	*Benincasa hispida* (Thumb.) Cogn.	Kuvindo	Cucurbitaceae	Fruits	Fruits
19	*Berberis aristata* Roxb. Ex Dc.	Chutro	Berberidaceae	Fruits	Fruits
20	*Bombax ceiba* L.	Simal	Bombacaceae	Flowers, fruits, seeds	Vegetable
21	*Butea buteiformis* (Voigt) Mabb.	Bhujetro	Leguminosa	Seeds	Fruits
22	*Cannabis sativa* L.	Ganja	Cannabaceae	Leaves	Pickle, fruits
23	*Cassia fistula* L	Rajbrikshya	Leguminosae	Fruits	Fruits, vegetable
24	*Castanopsis hystrix* Hook.f. & Thomson ex A. DC.	Katoos	Fagaceae	Fruits	Fruits
25	*Castanopsis indica* (Roxb. Ex Lindl.) A.Dc.	Dhalne katus	Fagaceae	Fruits	Fruits
26	*Centella asiatica* (L.) urb.	Ghodtaprile	Apiaceae	Leaves	vegetab1le
27	*Ceratosanthes palmate* (L.) Urb.	Indreni	Cucurbitaceae	Leaves, flower	Vegetable
28	*Chamaerops humilis* L.	Thakal	Arecaceae	Fruits. Leaves	Fruits, vegetable
29	*Chenopodium murale* L.	Kalo bethe	Chenopodiaceae	Leaf	Vegetable
30	*Chenopodum album* L.	Bethe	Chenopodiaceae	Fruits	Fruits
31	*Choerospondias axillaris* (Roxb.) B.L. burtt & A. W. Hill	Lapsi	Anacardiaceae	Fruits	Fruits
32	*Cinnamomum bejolghota* (Buch.-Ham.)Sweet	Sinkauli	Lauraceae	Whole plants	Spices
33	*Cinnamomum tamala* (Buch.-Ham.) T. Nees & Eberm	Tejpat	Lauraceae	Leaves	Spices
34	*Citrus decumana* L	Sankhatra	Rutaceae	Fruits	Fruits
35	*Colocasia esculenta* (L.)Schott.	Pindalu	Araceae	Tuber	Vegetable
36	*Curcuma aromatic* Salisb.	Ban haledo	Zingiberaceae	Rhizome	Spices
37	*Dendrocalamus hamiltonii* Nees & Arn ex Munro	Tama bans	Poaceae	Young shoots	Vegetable
38	*Depanostachyum falcatum* (Nees) Keng f.	Nigalo	Poaceae	Shoots	Vegetable
39	*Dioscorea alata* L.	Ghar tarul	Dioscoreaceae	Tuber	Vegetable
40	*Dioscorea bulbifera* L.	Bantarul	Dioscoreaceae	Tuber	Vegetable
41	*Dioscorea deltoidea* wall. ex griseb	Githa, vyakur	Dioscoreaceae	Tuber	Vegetable
42	*Dioscorea esculenta* (Lour.) Burkill	Tarul	Dioscoreaceae	Tuber	Vegetable
43	*Dioscorea hamiltonii* Hook. F.	Ban tarul	Dioscoreaceae	Tuber	Vegetable

44	*Diploknema butyracea* (Roxb.) H.J.Lam	Chiuri	Sapotaceae	Fruits	Fruits
45	*Docynia indica* (Wall.)Decne.	Mael	Rosaceae	Fruits	Fruits
46	*Dolichos lablab* L.	Simi	Leguminosae	Seeds	Vegetable
47	*Drymaria cordata* (L.) Wild.ex Schult	Abhijalo	Caryophyllaceae	Leaves	Vegetable
48	*Dryopteris cochleata* (D.Don) c. Chr.	Danthe Niuro	Dryopteridaceae	Leaves	Vegetable
49	*Duchesnea indica* (Jacks.)Focke	Bhui kafal	Rosaceae	Fruits	Fruits
50	*Eclipta prostrate* (L.) L	Bhrigraj	Compositae	Leaves	Vegetable
51	*Euphorbia hirta* L.	Dudhe jhar	Euphorbiaceae	Leaves	Vegetable
52	*Euphorbia royleana* Boiss	Siudi	Euphorbiaceae	Flowers	Vegetable
53	*Fagopyrum acutatum* (Lehm.) Mansf. Ex K. Hammer	Ban phaper	Polygonaceae	Leaves	Vegetable
54	*Fagopyrum esculentum* Moench	Mithe phaper	Polygonaceae	Leaves	Vegetable
55	*Fagopyrum tataricum* (L.) Gaern.	Tite phapar	Polygonaceae	Leaves	Vegetable
56	*Ficus benghalensis* L.	Bar	Moraceae	Fruits	Fruits
57	*Ficus hispida* L.f.	Khasreto	Moraceae	Fruits	Fruits
58	*Ficus lacor* Buch.-Ham.	Kabro	Moraceae	Bud, leaves, fruits	Vegetable
59	*Ficus religiosa* L.	Pipal	Moraceae	Fruits	Fruits
60	*Ficus semicordata* Buch.-Ham ex sm.	Khanyu	Moraceae	Fruits	Fruits
61	*Fragaria nubicola* (Lindl.ex Hook.F.) Lacaita	Bhui aiselu	Rosaceae	Fruits	Fruits
62	*Gaultheria fragrantissima* Wall	Dhasingari	Ericaceae	Fruits	Fruits
63	*Heracleum wallichii* DC.	Chimphing	Apiaceae	Seeds	Pickle
64	*Inula cappa* (Buch.-Hem. Ex D.Don)DC	Gai tihare	Compositae	Powder	Marcha
65	*Ipomoea batatus* (L.)Lam	Suthuni	Convolvulaceae	Tuber	Boiled
66	*Ipomoea queatica* forssk.	Kalmi sag	Convolvulaceae	Leaves	Vegetable
67	*Juglans regia* L	Okhar	Juglandaceae	Fruits	Fruits
68	*Justicia adhatoda* L	Asuro	Acanthaceae	Leaves, Flowers, Fruits	Vegetable, Pickle
69	*Lannea coromandelica* (Houtt.) Merr.	Dabdabe	Anacardiaceae	Fruits	Fruits

70	*Lantana camara* L	Kaligedi/ Sutkeri jhar	Verbenaceae	Fruits	Fruits
71	*Lilium nepalense* D. Don	Ban Lasun	Liliaceae	Leaves	Vegetable
72	*Lygodium flexuosum* (L.)Sw.	Parandi sag	Lygodiaceae	Young shoot	Vegetable
73	*Maclura cochinchinesis* (Lour.) Corner	Damaru	Moraceae	Fruits	Fruits
74	*Maesa macrophylla* Wall.	Bhogate/paha phal	Primulaceae	Fruits	Fruits
75	*Mahonia nepaulensis* DC.	Jamanimandro	Berberidaceae	Fruits	Fruits
76	*Mangifera indica* L	Aap	Anacardiaceae	Fruits	Fruits
77	*Melastoma malabathricum* L.	Angeri	Melastomataceae	Fruits	Fruits
78	*Mentha spicata* L.	Pudina	Lamiaceae	Leaves	Pickles
79	*Momordica dioica* roxb. Ex willd.	Ban karela	Cucurbitaceae	Fruits	Vegetable
80	*Morus indica* L.	Kimbu	Moraceae	Fruits	Fruits
81	*Mucuna pruriens* (L.) DC.	Kauso	Leguminosae	Fruits	Vegetable
82	*Murraya koenigii* (L.) Spreng	Boke januno	Rutaceae	Leaves, Fruits	Fruits, spices
83	*Myrica esculenta* Buch.-Ham. ex D.Don	Kafal	Myricaceae	Fruits	Fruits
84	*Nasturtium officinale* R.Br.	Sim sag	Brassicaceae	Leaves	Vegetable
85	*Neolamarckia cadamba* (Roxb.) Bosser	Kadam	Rubiaceae	Seeds	Oil
86	*Nephrolepis cordifolia* (L.) C. Prest	Pani amala	Nephrolepidaceae	Tuber and root	Fruits
87	*Ocimum sanctum* L.	Tulsi	Lamiaceae	Whole plants	Juice
88	*Ophioglossum reticulatum* L	Jibre sag	Ophhioglossaceae	Leaves	Vegetable
89	*Oroxylum indicum* (L.) Kurz	Tatelo	Bignoniaceae	Flowers,fruits	Pickle, vegetable
90	*Oxalis corniculata* l	Chariamilo	Oxalidaceae	Leves,	Vegetable
91	*Perilla frutescens* (L.) Britton	Silam	Lamiaceae	Seeds	Pickles
92	*Phyllanthus emblica* L.	Aamala	Phyllanthaceae	Fruits	Fruits
93	*Phytolacca acinosa* Rosb.	Jaringo	Amarylidaceae	Leaves	Vegetable
94	*Pinus roxburghii* Sag.	Sallo	Pinaceae	Seeds	Fruits
95	*Piper longum* L.	Ban Pipla	Piperaceae	Fruits	Fruits
96	*Plantago asiatica* subsp. *erosa* (Wall.) Z.Yu.Li	Isapgol	Plantaginaceae	Leaves	Vegetable

97	*Polygonium molle* D.Don	Thotne	Polygonaceae	Young shoot	Vegetable
98	*Prunus cerasoides* Buch.-Ham. Ex D.Don	Painyu	Rosaceae	Fruits	Fruits
99	*Pteris biaurita* L.	Kuthurke	Pteridaceae	Shoots	Vegetable
100	*Pteris vitata* L.	Niguro	Pteridaceae	Leaves	Vegetable
101	*Pyracantha crenulata* (Roxb. Ex D.Don) M.Roem	Ghangaru	Rosaceae	Fruits	Fruits
102	*Pyrus pashia* Buch.-Ham.ex D.Don	Mayal	Rosaceae	Fruits	Fruits
103	*Reinwardtia indica* Dumort.	Pyauli	Linaceae	Young leaves	Vegetable
104	*Rheum austral* D.Don	Padamchal	Polygonaceae	Leaves	Pickles
105	*Rhus chinensis* Wall.	Bhakimilo	Anacardiaceae	Fruits	Fruits
106	*Rhus parviflora* Roxb.	Satibayar	Anacardiaceae	Fruits	Fruits
107	*Ricinus communis* L.	Ander	Euphorbiaceae	Flowers	Vegetable
108	*Rubus ellipticus* Sm.	Aaiselu	Rosaceae	Fruits	Fruits
109	*Rumex acetosa* L.	Amile ghans	Polygonaceae	Leaves	Vegetable
110	*Rumex nepalensis* Spreng.	Halhale	Polygonaceae	Leves	Vegetable
111	*Sapindus mocorossi* Gearth.	Rittha	Sapindaceae	Fruits	Oil
112	*Scurrula elata* (Edgew.)Danser	Ainjeru	Loranthaceae	Fruits	Fruits
113	*Semecarpus anacardium* Lf.	Bhalayo	Anacardiaceae	Flower, fruits	Vegetable, fruits
114	*Shorea robusta* Gaerth	Sal	Dipterocarpaceae	Seeds	Boil or rosted
115	*Smilax zeylanica* L.	Kukurdainy	Smilaceae	Shoots	Vegetable
116	*Solanum nigrum* L	Bihi	Solanaceae	Fruits	Fruits
117	*Stellaria monosperma* Buch.-Hem.ex D.Don	Jethimadhu	Cryophyllaceae	Leaves	Vegetable
118	*Syzygium cumini* (L.) Skeels	Jamuna, Jamun	Myrtaceae	Fruits	Fruits
119	*Syzygium kurzii* (Duthie) N.P. Kalakr	Ambakay	Myrtaceae	Fruits	Fruits
120	*Tamarindus indica* L	Imili	Leguminosae	Fruits	Fruits
121	*Terminalia bellirica* (Gaerth.) Roxb.	Barro	Combretaceae	Fruits	Fruits
122	*Terminalia chebula* Retz.	Harro	Combretaceae	Fruits	Fruits
123	*Trapa bispinosa* Roxb.	Singada	Trapaceae	Nuts	Fruits

124	*Trichosanthes cucumerina* L	Ban chichinda	Cucurbitaeae	Fruits	Fruits
125	*Urtica dioica* L.	Sisnu	Urticaceae	Inflorescences and young leaves	Vegetable
126	*Viburnum erubescens* Wall.	Asarey	Adoxaceae	Fruits	Fruits
127	*Woodfordia fruitcosa* (L.) Kurz.	Dhayaro	Lythraceae	Nector	Nector
128	*Yushania maling* (Gamble) R.B. Majumdar & Karthik	Malingo	Poaceae	Young shoots	Vegetable
129	*Zanthoxylum armatum* DC.	Timur	Rutaceae	Fruits	Pickle, spices
130	*Zizipus incurve* Roxb.	Hade bayar	Rhamnaceae	Fruits	Fruits
131	*Zizipus mauritiana* Lam.	Bayar	Rhamnaceae	Fruits	Fruits
132	*Zizipus nummularia* (Burm.f.) Wight & Arn.	Jangali bayar	Rhamnaceae	Fruits	Fruits

Uses of wild edible plants

Wild edible plants were found to be used for different purposes. Vegetables were obtained from 59 plant species followed by fruits (51 species), pickles (10 species), spices and condiments (5 species) juice (1 species), oil (1 species), tea (1 species), nectar (1 species) and marcha (fermenting substance 1 species). The seeds are consumed after boiling or roasting. Some seeds of the plant was found to be rich in nectar like *Woodfordia fruitcosa* (L.) Kurz (Fig. 1).

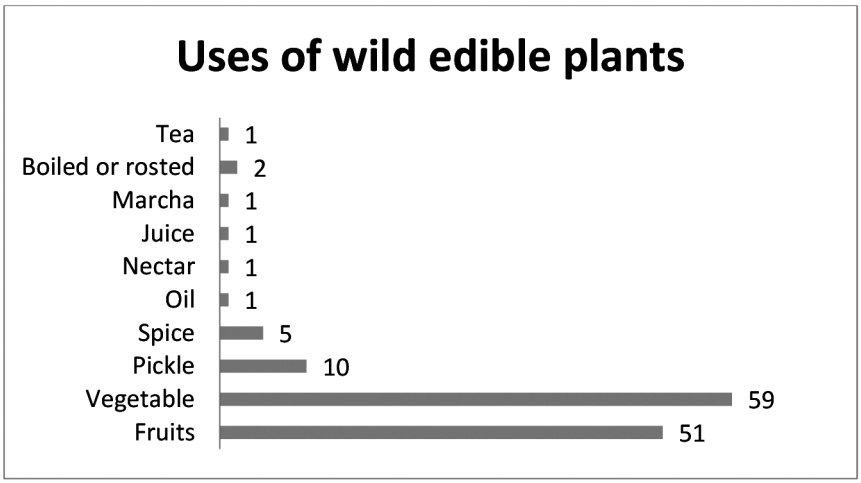

Figure 1: *Total number of species under different use categories.*

Different parts of the plants are used for different purpose. Most common parts of wild edible plants consume by local peoples are fruits, which contain about 59 species followed by leaves 37 species), young shoot (12 species), root or tuber (11

species), seeds (9 species), flower (8 species),whole plants (2 species) and bark, nectar, nuts, inflorescence and buds one species each (Fig. 2).

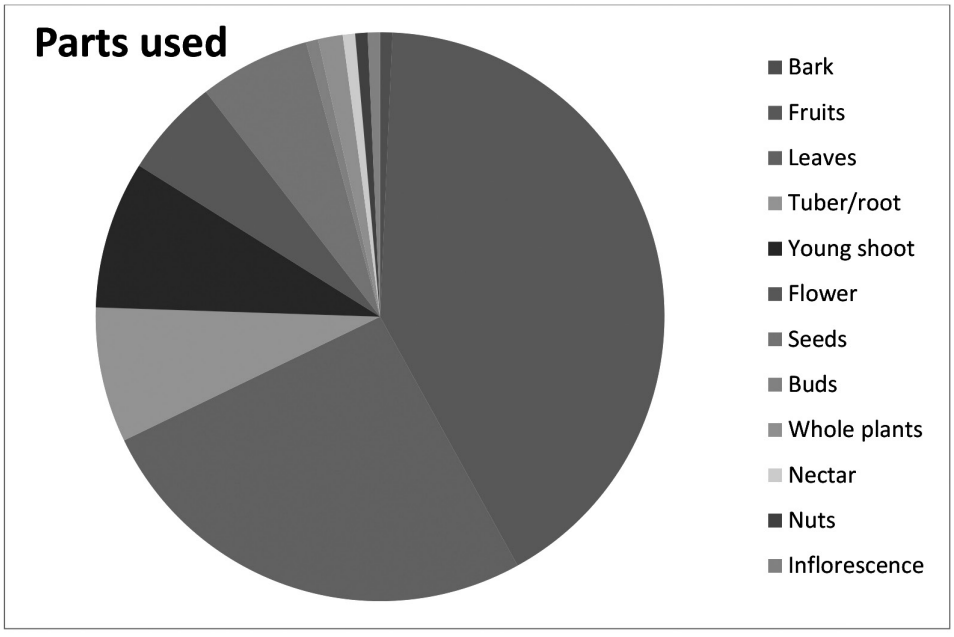

Figure 2: *Different parts of wild edible plants use by local people.*

Conclusion

It is evident from the study that the people of Dhankuta district consumed considerable amount of wild edible plants that makes a major contribution to dietary intake during food scarcity as well as as a supplementary food. There are about 132 species of wild edible plants are consume by local people of which, 59 species of plants are used mostly as vegetable, 51 species of plants are used mainly for the purpose of fruits, 10 species are used as pickle, 5 species are used as spice and condiments and other species are used as juice, oil, nectar, and fruits. However, the rural people have the very little knowledge about the nutritional value as well as toxic effects of the wild edible plants due to prolonged consumption therefore further effort should be taken for the research on the nutritional value and their advantage and disadvantage to the consumer.

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