

Common Orchids of Darjeeling Hill with Traditional Medicine Importance

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Abstract

Darjeeling is an internationally well-known hill station in the Eastern Himalayas. The Eastern Himalaya is a part of the total Himalayan range, a biodiversity hotspot area among the world's 36 and one of India's four biodiversity hotspots. Orchid flora in Darjeeling is very rich. There are 109 genera with 392 species of orchids reported from this area. Among these 20% are terrestrial and 80% among them epiphytic. Some species of Orchids are medicinally important and well-known to the Chinese before 2800 BC. *Acampe papillosa*, *Acampe rigida*, *Aerides multiflorum*, *Arundina graminifolia*, *Bulbophyllum guttulatatum*, *Coelogyne cristata*, *Cymbidium devonianum*, *Dendrobium aphyllum*, *Eria lasiopetala*, *Vanda coerulea*, *Vanda tessellate*, *Vanda testacea* are highly medicinal important and commonly recommended to the local people by the local non-certified medical practitioners. Different plant parts of these orchids are used for curing different common diseases like fever, jaundice, skin infections, bone fractures, paralysis, wounds, stimulants, boils, blood clotting, cholera, boils, pimples, etc. of hill peoples. The bioactive compounds present in some orchids are used as anti-cancer or anti-tumor, some have anti-microbial, anti-inflammatory, antiplatelet aggregation, neuroprotective, antimutagenic, antipyretic, etc. properties. However, the actual property of extracted compounds from some orchids is still not known. Therefore, this article aims to summarize the common orchids found in Darjeeling Hill and the use of these plants in traditional medicine. The traditional knowledge of medical sources re-established with modern scientific knowledge helps us to depend on those plants which are very much threatened in their habitat. The knowledge will help preserve the medicinally important orchids and their surrounding species, leading to habitat sustainability. Finally, the information can accelerate modern, pharmacological research and findings.

Key words: Biodiversity hotspot, Darjeeling hill, Medicinally important orchids, Threatened, Traditional medicine

Darjeeling is called the 'Queen of Hills' situated at 27.04° N, 88.26° E Coordinates. Orchids and other plants abound in the Eastern Himalaya, where Darjeeling Himalaya is located, making this region a global point of biodiversity [1]. In a recent study, researchers uncovered 109 genera with 392 orchid species in the various forest habitats of Darjeeling [2-5]. Among these 20% are terrestrial and 80% among them epiphytic in habitat. Orchids are the highly evolved plant group in the plant kingdom [6]. Orchids are easy to identify among plants, it requires little experience to identify than other groups of plants. Orchid is perennial, terrestrial, epiphytic, and sometimes vine-like (Fig 1-2). This plant has peculiar morphology, and an attractive flower makes this plant remarkable and distinct from other groups of plants. Due to the high altitudinal variation in the Himalayan range, this region is highly climatically diverse and helps to grow and evolve diverse medicinally important plants [7]. In rural and remote places, people rely entirely on forest resources for their survival, providing them with everything from medicine and food to fuel and household items

[8]. There is also a wealth of written material pertaining to the Darjeeling Himalaya's traditional ethnomedicinal practices [8]. Along with the socio-economic status of the conservativeness, their income, and the locational disadvantages for the tribal peoples in this area make them almost fully dependent on plant-based unclassified medicines. Medicines derived from plants, animals, and minerals; spiritual therapies; manual techniques and exercises; used singly or in combination to cure, diagnose, prevent, or maintain health; all fall under the umbrella term traditional medicine [9]. Many people are fascinated by orchids because they exhibit such a broad range of life forms, habitat preferences, reproductive techniques, sizes, colours, and smells [10-12]. Stilbenes, dihydrostilbenoids, phenanthrenes, alkaloids, terpenes, flavonoids, anthocyanins, and phenolic acids are only a few of the secondary metabolites that have been found in orchids and are of physiological, ecological, and pharmaceutical significance [13-15]. However, mostly illiterate medical practitioners recommend plants as medicine for different diseases and interestingly the disease is cured by the

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intake of this unknown or unidentified plant extract present in the plant as a form of medicine. However, the actual property of extracted compounds from some orchids is still not known. Sometimes, the plant has the property to cure diseases but the active compound is not extractable for commercial medicine or

modern medicine. Therefore, this review article aims to summarize the common orchids found in Darjeeling Hill and the use of these plants in traditional medicine. So that the information can accelerate modern, pharmacological research and findings.



Fig 1 *Eria stricta* Lindl. in flowering condition (from Darjeeling)
Fig 2 Whole plant with pseudo-bulb of *Coelogyne flaccida* (from Darjeeling)

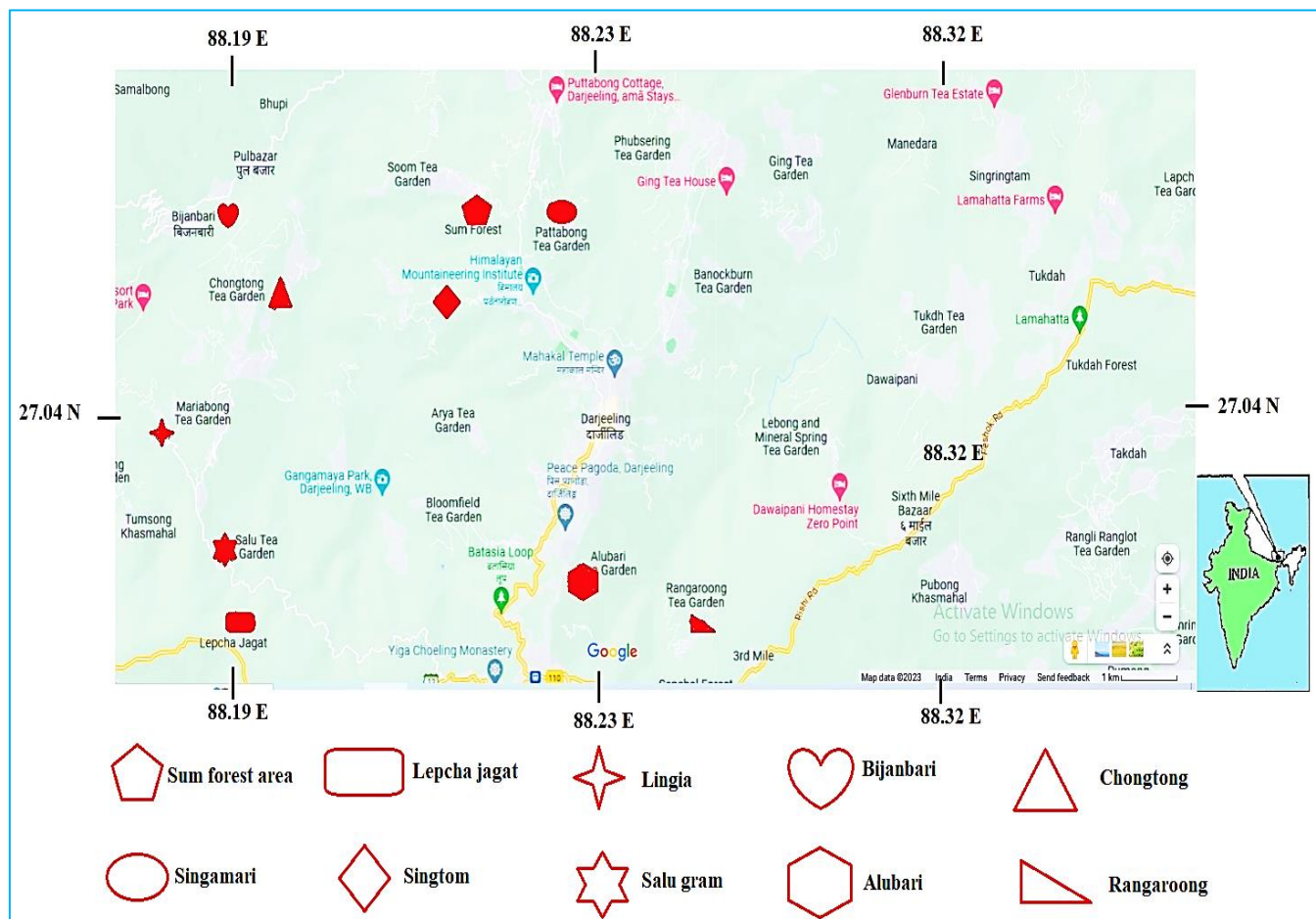


Fig 3 Geographic locations (in Google map) of the ten tribal localities of Darjeeling Hill, taken for the study

MATERIALS AND METHODS

A series of surveys in different places of Darjeeling Hill was conducted from February to November 2022 (Fig 3). The different localities were selected where mostly the tribal peoples reside. After talking with many *Phyto-medicine* practitioners (Table 1) with some specific questioners gathered some orchid names and their medical use taken by the local people. The preliminary came out results are crossed checked by other practitioners or local people and finally with established literature wherever possible.

RESULTS AND DISCUSSION

In the survey, 26 (Twenty-six) medicinal orchid names were documented. The name of the orchids and their medicinal use by different tribal communities of Darjeeling Hill are summarized in the following (Table 2). The different plant parts of orchids are used for the treatment of different diseases are depicted in (Fig 4). It is also to be noted that the methods of

plant part preparation for particular diseases are crucial for the treatment of particular diseases. The present investigation shows different orchid plant parts with their different method of intake by patients are presented in (Fig 5). The paste of different plant parts are used maximum and the plant extract is used minimum.

Himalayan regions are the haven for medicinal plants and was maintained since Ramayana. Many researchers collected, documented, and identified many ethno medicinal important plants and orchids from Darjeeling Himalaya [16-21]. Different human communities present in the Darjeeling Hill area used orchids as a medicine for different diseases. Depending on the plant used, the Lepcha would make an extract, decoction, juice, paste, or powder for medical purposes [1]. Roots, pseudobulbs, leaves, flowers, fruits, and seeds were frequently harvested from plants [1]. They frequently used plant-based unconventional medicine. Traditional medical practitioners used different plant parts for making medicine. They mix the juice or powder form with other parts of the orchid extract and make these useful for a particular disease [1].

Table 1 List of phyto-medicine practitioners of different tribal regions of Darjeeling Hill

S. No	Name of the practitioner	Area / Locality	Gender	Age (Years)	Community
1	Girvesh Rai	Singamari	Male	68 ⁺	Rai
2	Maboo Thapa	Sum forest area	Female	79 ⁺	Thapa
3	Gurrehmat Thapa	Singtom	Male	51 ⁺	Thapa
4	Yozona Tamang	Lingia	Female	58 ⁺	Tamang
5	Norchung Lepcha	Lepcha jagat	Male	65 ⁺	Lepcha
6	Taral Sunwar	Rangaroong	Male	80 ⁺	Sunwar
7	Laboong Jogi	Salu gram	Female	71 ⁺	Jogi
8	Jeevan Rai	Alubari	Male	66 ⁺	Rai
9	Illam Sunwar	Chongtong	Male	46 ⁺	Sunwar
10	Tsungbo Thami	Bijanbari	Female	67 ⁺	Thami

Table 2 Table showing the orchids commonly used as a medicine by the different tribal communities of Darjeeling Hill

S. No.	Name of orchid	Plant parts used	Methods of plant preparations	Medical use
1	<i>Acampe papillosa</i> (Lindl.) Lindl.	Root and leaves	Paste	Pain clear, indignation, snake bite
2	<i>Acampe praemorsa</i> var. <i>praemorsa</i> (Roxb.) Blatt. & McCann	Root	Paste	Cooling property, <i>Rheumatism</i> , <i>blood purifying</i>
3	<i>Acampe rigida</i> (Buch. - Ham. ex Sm.) P.F. Hunt	Root, leaves, stem, flower, fruit	Juice	Jaundice
4	<i>Aerides multiflorum</i> Roxb	Root, leaves, stem, flower, fruit	Juice	Pain clear, cut and wounds
5	<i>Arundina graminifolia</i> (D. Don) Hochr	Leaves and stem	Paste	Skin infection and black skin
6	<i>Bulbophyllum guttulatum</i> (Hook.f.) N.P.	Stem and bulb	Juice	Burn and wounds
7	<i>Bulbophyllum leopardinum</i> (Wall.) Lindl	Root, leaves, stem, flower, fruit	Juice	Bone fracture
8	<i>Coelogyne cristata</i> Lindl.	Stem and bulb	Paste	Wounds treatment
9	<i>Coelogyne flaccida</i> Lindl.	Root, leaves, stem, flower, fruit	Juice, Powder	Indigestion, head pain
10	<i>Cymbidium devonianum</i> (Hook.f.) Paxton	Root, leaves, stem, flower, fruit	Paste, Juice, Powder	Pain clear, cold and cough
11	<i>Cymbidium aloifolium</i> (L.) Swartz.	Root, leaves, stem, flower, fruit, seeds	Paste, Juice, Powder	Major illness, vertigo, eye
12	<i>Cymbidium devonianum</i> Lindl. Ex Paxt.	Root, leaves, stem, flower, fruit, seeds	Juice	Nerve stimulant, paralysis, healing wounds
13	<i>Dendrobium aphyllum</i> (Roxb.) C.E.C.Fisch.	Root, leaves, stem, flower, fruit	Paste	Applied for boils and skin disorder
14	<i>Dendrobium fimbriatum</i> Hook.	Leaf and flower	Paste, Juice	Leaver and nerve disorder, used for cholera treatment and pimples and boils

15	<i>Dactylorhiza hatagirea</i> (D.Don) Soó	Leaf and tubers	Paste, Juice, powder	Stomach pain, high and frequent fever, cold and cough, diarrhoea, and dysentery
16	<i>Dendrobium moschatum</i> (Buch.-Ham.) Sw.	leaf	Juice	Pain in the ear, and good blood clotting agent
17	<i>Eria lasiopetala</i> (Willd) Ormerod.	Root, leaves, stem, flower, fruit	Paste, Juice	Boils, burns, and wounds
18	<i>Eria stricta</i> Lindl.	Root, leaves, stem, flower, fruit	Extract	Muscular reluctant
19	<i>Panisea uniflora</i> (Lindl.) Lindl	Leaf and stem	Paste	Wounds treatment
20	<i>Phalaeonopsis manni</i> Rchb.f	Flowers	Paste	Wounds, hair growth
21	<i>Thunia alba</i> (Lindl.) Rchb. f.	Leaf	Paste	Dislocation of bones
23	<i>Vanda coerulea</i> Griff. Ex Lindl.	Flowers	Juice, Paste	Glaucoma, blurry visions
24	<i>Vanda cristata</i> wall. Ex Lindl.	Flowers	Juice, Paste	Tumour, and skin care
25	<i>Vanda tessellata</i> (Roxb.) hook. Ex G.Don	Flowers, stem, and leaf	Juice, Paste	Bone fractures and skin diseases
26	<i>Vanda testacea</i> (Lindl.) Rchb. f.	Flowers, leaf and stem	Juice, Paste	Bronchitis, rheumatism, dysentery, dyspepsia

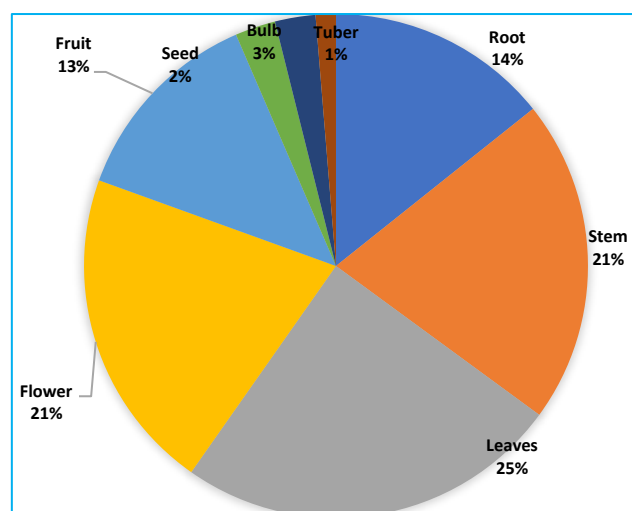


Fig 4 A pie chart showing the different plant parts used by traditional practitioners for treatment

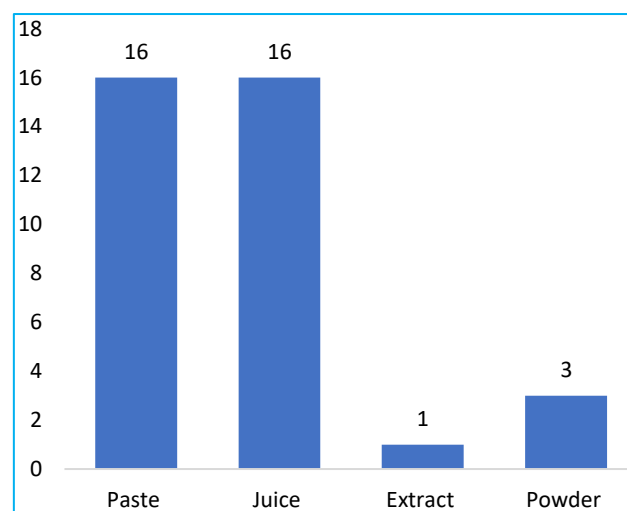


Fig 5 Different orchid plant parts intake method summarized by the practitioners

CONCLUSION

Darjeeling is the natural home for some orchid species. The ethnomedicinal use of plant extracts started in prehistoric times. Still, these folk medicines are popular in various human communities. However, recent medical, pharmaceutical, and other allied sciences advancements made synthetic medicine for treating modern diseases. However, the use of traditional medicine is still active. The knowledge and the disease-curing

information will help recent researchers to discover a medicine for humankind. However, the biodiversity loss and habitat destruction by natural and anthropogenic caused the extinction of these orchid species. Traditional medicine is still used as a foundation for today's pharmacopeia. If these plants are not present in their natural habitat, they will be a great loss to humanity. Therefore, it is critical to safeguard the region's unrecorded orchids and the indigenous knowledge of the local peoples to pass it down to future generations.

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