

## Medicinal plants used as antipyretic agents by the traditional healers of Darjeeling Himalayas

D R Chhetri

Panchavati Greentech Research Society, P.O. Box No. 79, Darjeeling  
HPO, Darjeeling 734101 West Bengal  
E-mail: jumanjee@sify.com

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Darjeeling Himalayan region is characterized by a rich floral diversity. Since most of the hilly terrain is devoid of modern medical facilities, the people here are dependent on Traditional Medicine Systems for their health-care. During the course of the study, it was found that 37 species of plants belonging to 29 families are utilized as antipyretic agents in the different ethnic medicine practices prevalent in the region.

**Keywords:** Antipyretic activity, Folk medicine, Herbal medicine, Ethnomedicine, Traditional medicine.

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Body temperature rises due to derangement of heat regulating mechanism in the brain. The rise in body temperature above 99°F is called fever. Fever generally occurs due to the infections by virus, bacteria, protozoa and other microorganisms that produce pyrogens. These pyrogens act on WBC which in turn produce endogenous toxins. They act on the anterior hypothalamus and the body temperature is elevated causing fever<sup>1</sup>. Fever leads to the disturbance of metabolism and it increases blood pressure, pulse rate, cardiac output, respiration rate, etc. Most Traditional Medicine Systems believe that fever is not a disease in itself but the symptom of some other diseases. The antipyretic agents treat these symptoms

and completely eliminate fever. Herbal antipyretic agents are favoured over the chemical ones for their compatibility to the human physiological system, easy availability and the rich knowledge about the traditional healing systems.

Darjeeling hills are situated between the 28° 31'-27° 13' North and 87° 59' -88° 53' East in the Eastern Himalayan region of India. Out of the four sub-divisions of Darjeeling district, Kalimpong, Kurseong and Darjeeling Sadar comprise the hilly areas covering an area of 2417 sq km. These hilly regions are further divided in 8 blocks. The population of the hill areas of Darjeeling is above 1 million of which 78.42% population lives in rural areas and 21.5% in urban agglomerations. This

part of the Himalayas is the cornucopia of ethnicity. The major ethnic groups of the region are Lepcha, Bhutia and the Nepalese. Nepalese is a conglomerate of mongoloid tribals like Sherpa, Limbu, Tamang, Yolmo, Kagatay, etc. and the aryan non-tribals like Chhetri, Bahun, Sanyasi, Kami, Damai, etc. Intermediate between the two groups are the Newars, showing partial characteristics of both the groups. Each of these tribal groups has its own distinct culture, language and traditions. However, Nepali language is the medium of communication between the tribes. These tribes also have rich ethnomedicinal traditions for which a few records are available<sup>2-7</sup>. The prevalence of the folk-medicine practice is found in places where the amenities of modern society are not available. The tough terrain and vast natural barriers force the people of this region to depend on herbal medicine<sup>8</sup>. However, the use of Traditional Medicine is prevalent even among the urban people of this region<sup>9</sup>.

### Methodology

Regular field trips to different areas of Darjeeling hills were conducted between September 2001 and April 2003 to collect the ethnomedicinal information and herbarium specimens. Altogether, 19 villages were covered during the ethnomedicinal field survey of the present study. These villages are Maney Bhanjyang, Sukia Pokhri, Kal Pokhri, Meghma, Chha Mile, Permaguri, Majhidhura, Lami and Rimbik in Darjeeling Sadar sub-division; Sukna, Garidhura, Namsu, Turyok, Lanku and Rollok in Kurseong sub-division and Gorubathan, Gairibas, Tohday and Pe-

dong in Kalimpong sub-division. The tribal people including local healers, Jhankris (Nepalese traditional healer), Bongthings (Lepcha medicine men), Lamas (Bhutia priest) were interviewed. A total of 28 traditional healers were interviewed during the course of the study. Information from elder persons from the villages having some idea of the local herbal traditions was also gathered. Preliminary identification of collected plant materials was done with help of the Traditional Medicine practitioners. The local names of the plants and information regarding their use were also recorded with the help of these practitioners and village elders. Information obtained from more than three sources only has been incorporated here. Subsequently, the collected plants were identified at the Panchavati Greentech Research Society, Darjeeling and the voucher herbarium specimens were deposited in the herbarium of the Medicinal Plants Division, Panchavati Greentech Research Society, Darjeeling, India.

### Results

In the enumeration, data on 37 species of plants used as antipyretic agents are presented in the following sequence: - serial number, botanical name, family (in parenthesis), local name in Nepali, voucher specimen number followed by the plant part used and the mode of use (in brief). In the present report, decoction means a solution derived from boiling the medicinal herbs with about 3 volumes of water; infusion means the liquid obtained by soaking the plant parts in hot water for a considerable time; extract denotes the

liquid obtained by grinding the plant parts with equal volume of water and filtering through a fine cloth while juice signifies the liquid obtained by crushing and pressing the useful plant parts without water. Whenever more than one species belonging to the same genus was used for the same purpose, only the more commonly used species is enumerated.

- 1 *Aconitum ferox* Wall. (Ranunculaceae), Bikhumma, [HINR-08]. Dried root (about 100 mg) is chewed or the decoction of the root (10-15 ml) is taken 2-3 times for 2 days.
- 2 *Acorus calamus* L. (Araceae); Bojo, [HINR-05]. Dried rhizome (2-3 gm) is chewed or the decoction of rhizome (15-30 ml) is taken orally (2-5 times) till required in case of fever and rheumatism.
- 3 *Adiantum capillus-veneris* L. (Adiantaceae); Kane uniu, [PGRS-67]. Fresh leaflets (5 gm) crushed, boiled and about half a cup is taken twice daily for 3-5 days.
- 4 *Adina cordifolia* Willd. (Rubiaceae); Pahenley, [PGRS-23]. Decoction of stem bark (10-15 ml) is used in the morning for 4-5 days.
- 5 *Aeschynanthus sikkimensis* Stapf (Gesneriaceae), [PGRS-107]. Decoction of the root (15-20 ml) is taken 2-3 times daily.
- 6 *Ageratum conyzoides* L. (Asteraceae); Ilamay, [PGRS-48]. Decoction of leaves and tender twigs (50 ml) is taken after breakfast for a week.
- 7 *Alternanthera sessilis* DC. (Amaranthaceae); Saranchi saag, [PGRS-241]. Decoction of leaves and twigs (30-50 ml) is taken with two principal meals of the day.
- 8 *Capsella bursa-pastoris* (L.) Medic. (Brassicaceae); Tori jhar, [PGRS-83]. Leaf juice (5-10 ml) is used in malarial fever.
- 9 *Costus speciosus* (Koenig) Sm. (Zingiberaceae); Bellauree [PGRS-28]. Root (5-10 gm) is made into paste and taken with jaggery in empty stomach for 4-6 days.
- 10 *Curcuma zedoaria* Rose. (Zingiberaceae); Kalo hardi, [PGRS-59]. Decoction of rhizome (25-50 ml) is taken once daily for 3-4 days.
- 11 *Dichroa febrifuga* Lour. (Hydrangiaceae); Paharay. Basak [PGRS-46]. Leaf infusion (50-75 ml) is taken 2 times daily for 3-4 days in fever and cough.
- 12 *Drymaria cordata* Willd. (Caryophyllaceae); Abhijalo [PGRS-53]. The whole plant is placed over burning charcoal and the vapour inhaled 2 times daily for 3 days.
- 13 *Evodia fraxinifolia* Hook. (Rutaceae); Khanakpa, [PGRS-136]. Stem bark decoction (20-25 ml) is given 3-4 times daily for 2-5 days in fever.
- 14 *Gynocardia odorata* R. Br. (Flacourtiaceae); Gantay [PGRS-44]. The fruit juice (15-20 ml) is used or the fruit is eaten raw once a day for 3-6 days.
- 15 *Heracleum wallichii* DC. (Apiaceae); Chimphing [PGRS-31]. Decoction of the dried seeds (15-20 seeds) is taken orally 2 times daily for 5 days in influenza.

- 16 *Hydrocotyle asiatica* L. (Apiaceae); Golpatta, [PGRS-51]. The whole plant juice (5-10 ml) is taken 2 times daily till the fever subsides.
- 17 *Juniperus communis* L. (Cupressaceae); Sukpa, [HINR-42]. Dried fruit is chewed as a nut or its decoction (10-15 ml) is taken 2-3 times daily for 2-6 days.
- 18 *Melissa parviflora* Benth. (Lamiaceae); Sugandhi, [PGRS-49]. The juice of fresh leaves and twigs (5-7 ml) is taken with honey 2-3 times daily for 5-6 days.
- 19 *Mussenda frondosa* L. (Rubiaceae); Dhotisara, [PGRS-63]. Leaf extract (10-15 ml) is taken 2-3 times daily.
- 20 *Nardostachys jatamansi* DC. (Valerianaceae); Jatamansi, [HINR-35]. Root decoction (10-15 ml.) is used 2 times daily for about 7 days.
- 21 *Orchis latifolia* L. (Orchidaceae); Panch-aunlay, [HINR-134]. The infusion (25-30 ml) made from fresh tuber paste or the decoction of dried root (10-15 ml) is taken for 3-4 days.
- 22 *Paedaria foetida* L. (Rubiaceae); Barilahara, [PGRS-215]. Decoction of leaves (40-50 ml) is taken twice daily for 5-7 days.
- 23 *Paris polyphylla* Smith. (Liliaceae), Satuwa, [HINR-122]. The rhizome infusion (20-25 ml.) is taken early in the morning for 5-6 days.
- 24 *Passiflora nepalensis* Wall. (Passifloraceae), Garendal, [PGRS-24]. Root decoction (10-15 ml) is taken 2-4 times daily for 4-5 days.
- 25 *Picrorhiza kurrooa* Benth. (Scrophulariaceae); Kutki, [HINR-62]. Dried root (0.5-1 gm). powder is taken orally once a day for 3-4 days in fever and malaria.
- 26 *Piper longum* L. (Piperaceae) Pipila, [PGRS-37]. Infusion of dried fruit (40-50 ml obtained from about 15 fruits) is taken orally 2-3 times daily in cough and fever.
- 27 *Plantago major* L. (Plantaginaceae); Jibray jhar, [PGRS-56]. Decoction of the whole plant along with root (15-25 ml) is taken orally for 3 days.
- 28 *Prunus cerasoides* D. Don (Rosaceae); Paiyun, [PGRS-232]. Decoction of stem bark (15-20 ml) is taken orally 2-3 times daily for 3-6 days.
- 29 *Rhododendron campanulatum* D. Don (Ericaceae); Nilo Chimal, [HINR-71]. Dried leaf powder is taken as snuff and the dried wood infusion (50-100 ml) is drunk twice daily for 2-3 days.
- 30 *Rubia cordifolia* L. (Rubiaceae); Majito, [PGRS-159]. Decoction of dried root (1-2 gm) or fresh root juice (5-10 ml) is taken 1-3 times daily for 3-5 days.
- 31 *Salix babylonica* L. (Salicaceae); Bains, [PGRS-65]. Leaf and stem bark infusion (50-60 ml) is taken once daily for 4-5 days.
- 32 *Stephania glabra* (Roxb.) Miers. (Menispermaceae); Tamarke, [HINR-13]. Tuber (5-10 gm) is chopped, crushed and taken with milk once a day for 3-4 days.
- 33 *Swertia chirayita* Karst. (Gentianaceae); Chireto, [PGRS-07]. The whole plant including the root is dried and the infusion (30-50 ml, pre-

pared from 1-2 gm of dried material) is taken 2 times daily for 3 days in viral fever.

- 4 *Thalictrum foliolosum* DC. (Ranunculaceae); Dampatay, [PGRS-178]. Root decoction (10-20 ml) is used 3 times a day for 4-5 days.
- 5 *Tinospora cordifolia* Willd. (Menispermaceae), Gurjo, [PGRS-55]. The infusion (50 ml) or decoction (15 ml) of stem is taken 2-3 times a day for 5 days.
- 6 *Viola serpens* Wall. (Violaceae); Ghattejhar, [HINR-86]. Root juice (5-10 ml) is taken twice daily for 3 days.
- 7 *Zanthoxylum alatum* Roxb. (Rutaceae); Bokay Timmur, [PGRS-44]. The decoction of the bark (15-25 ml) is taken 2-3 times daily for 3-4 days.

#### Discussion

In the present study, it was found that a total of 37 species of plants belonging to 9 families are utilized in the Darjeeling Himalayan region as a medicine for fever. The family with highest number of plants showing antipyretic activity is Rubiaceae (4 species) followed by Apiaceae, Menispermaceae, Ranunculaceae and Rutaceae (2 species each). Rest of the families is represented by only one species each. The medicinal recipe was generally prepared in the form of infusion or decoction (by boiling or soaking in hot water); extract or juice (by crushing the fresh plant parts with or without water); powder (by grinding the dried plant parts).

Considering the plant parts used, over 90% of the plant collections involve destructive harvesting practices because of

the use of plant parts like root (30%), rhizome (8%), bark (13%), stem (2.7%) and whole plant (11%). This pattern of use poses a definite threat to the genetic stocks and to the diversity of medicinal plants<sup>10</sup>. Therefore, the herbal heritage of this Himalayan region must be protected for the posterity, which may ultimately lead to the development of new molecules for human health as well as national economy.

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