

## Notes on Himalayan Hepaticae 2: New records and extensions of range for some Himalayan Leafy Liverworts<sup>1</sup>

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(Received 2 December 2004, accepted 3 December 2004)

**Abstract** – Records are presented for 24 species of Hepaticae from the Himalayan region, collected on expeditions from the Royal Botanic Garden, Edinburgh. Three species are reported as new to the Himalaya, all from Nepal (*Geocalyx lancistipulus*, *Tritomaria quinqueidentata* and *T. scitula*), two species new to India, both from Sikkim (*Andrewsianthus ferrugineus* and *Lophozia decolorans*); seventeen species new to Nepal including *Cephaloziella magna*, *Scaphophyllum speciosum*, *Schiffneria hyalina* and *Temnoma setigerum*; six species new to Sikkim including *Haplomitrium hookeri*, and three species new to China, all from Yunnan Province (*Diplophyllum trollii*, *Geocalyx lancistipulus* and *Lophozia decolorans*). Perhaps the most significant reports are the three new Himalayan records, especially *Geocalyx lancistipulus*, previously known only in Japan; the expansion of known distribution of species considered to be local Himalayan endemics, *Andrewsianthus ferrugineus*, *Cephaloziella magna* and *Diplophyllum trollii*; the extensions of range to two very rare disjunct species *Scaphophyllum speciosum* and *Temnoma setigerum*, and lastly the discovery that the widespread but rare *Lophozia decolorans* may be more abundant in the Sino-Himalaya than elsewhere in the world.

**Hepaticae/ Liverworts / Himalaya / India / Nepal / Sikkim / China / Yunnan / new records**

### INTRODUCTION

Since 1975 the author has been able to collect bryophytes, especially Hepaticae, on a series of botanical expeditions to the Himalayan region and Western China. This work was actively encouraged by Rieclaf Grolle, who had a strong interest in the region, particularly Nepal (Grolle 1966, 1974) and who undertook a major role in identifying many of the recent collections, for example in the genus *Plagiochila*, and in those from Bhutan (Long, 1979; Long & Grolle, 1990). The records below are a selection of some of the more interesting new records and extensions of range which have not already been published; these result primarily from the following expeditions:

1. East Nepal, Kew-Edinburgh Kanchenjunga Expedition, August-October 1989.
2. East Nepal, Edinburgh Makalu Expedition, September-October 1991.

1. The first part in this series was published in the *Journal of the Hattori Botanical Laboratory* 74: 77-81, 1993.  
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3. Central Nepal, April-May 1992.

4. India, West Bengal, Darjeeling District and Western Sikkim, Edinburgh Sikkim Expedition, July-August 1992.

5. India, Northern Sikkim, Edinburgh Expedition to Northern Sikkim, July 1996.

In addition, some records are included where relevant from expeditions to China, Yunnan Province in 1990 and 1993.

The specimens cited below have been collected by David Long and are housed at the Royal Botanic Garden, Edinburgh (E); many duplicates are housed in the Herbarium Haussknecht, Jena (JE). They have been identified by Dr Riclef Grolle, Dr Jiri Váňa and the author. Records have been checked against a wide range of floristic publications on Himalayan liverworts; the most comprehensive of these lists are by Grolle (1966, 1974), Hattori (1967, 1975), Long & Grolle (1990), Miehe (1990) and Noguchi *et al.* (1966). Distributions in western China (Yunnan, Sichuan Provinces) have been checked in Piippo (1990), Piippo *et al.* (1997, 1998), Gao & Cao (2000) and Wu & Wang (2000). Author abbreviations follow Brummitt & Powell (1992).

## RECORDS

### Cephaloziaceae

#### *Cephalozia gollanii* Steph.

**Nepal, East:** Taplejung District, N bank of Simbua Khola below Tseram, 27°31'N, 87° 56'E, *Abies/Rhododendron* forest, on log, 3450m, 21 ix 1989, *Long 17115*; det. Váňa.

**New to Nepal;** known from Himalaya (NW, Darjeeling, Bhutan), Thailand, China (Guangdong, Taiwan) and Japan (Inoue, 1981; Long & Grolle, 1990; Piippo, 1990).

#### *Cephalozia hamatiloba* Steph. (= *C. otaruensis* Steph., *C. siamensis* N. Kitag.)

**Nepal, Central:** Lalitpur District, Royal Botanic Garden, Godaveri, open woodland, on soil bank, 1550 m, 9 × 1989, *Long 17590*.

**Nepal, East:** Dhankuta District, Shidua ridge above Hille, 27°03'N, 87°24'E, cliff on open hillside, on shady rock face, 2380 m, 27 viii 1989, *Long 16436*; Terathum District, forested ridge between Basantpur and Door Pani, 27°07'N, 87°24'E, mossy *Rhododendron* forest, on shady soil bank, 2720 m, 28 viii 1989, *Long 16450*; Taplejung District, descent from Buje Daurali to Nesum, Tamur Valley, 27°20'N, 87°35'E, mossy oak forest, on tree trunk, 2620 m, 31 viii 1989, *Long 16517*; all det. Váňa.

**New to Nepal;** synonymy follows Váňa (1988, 1993) who reported the species from the Himalaya (Nepal, Bhutan), S. India, Thailand, Sumatra, Java, Borneo, Taiwan, Korea, Japan and Sakhalin. No localised records from Nepal were published, however.

***Odontoschisma denudatum* (Nees) Dumort.**

**India, Sikkim:** North District, Kabi, N of Gangtok, 27°24'N, 88°36'E, evergreen broad-leaved forest, on damp rotten log, 1730m, 31 vii 1992, *Long 22999*.

**New to Sikkim;** in Himalaya reported from Nepal and Bhutan (Long & Grolle, 1990); widespread in boreal and sub-boreal North America and Europe, also in E. Asia including Borneo and scattered localities in the neotropics (Gradstein & Váňa, 1987).

***Schiffneria hyalina* Steph.**

**Nepal, East:** Taplejung District, N-facing slopes of Dobala Danda above Kabeli Khola, 27°27'N, 87°56'E, ravine in wet mossy oak/ laurel forest, under rock overhang, 2350 m, 28 ix 1989, *Long 17400*; Terathum District, forested slope above Chauki, N side of Tinjure Danda, 27°12'N, 87°28'E, ravine in partly cleared *Rhododendron arboreum*/*Quercus semecarpifolia* forest, on shady rock face, 2690 m, 26 x 1991, *Long 21611*; Sankhuwasabha District, tributary on SW side of Saldim Khola, NW of Hatiya, 27°45'N, 87°16'E, steep valley with *Abies*/*Tsuga*/*Rhododendron* forest, on shady bank by stream, 2910 m, 11 x 1991, *Long 21140*; det. Long.

**New to Nepal;** in Himalaya reported from Darjeeling, Sikkim and Bhutan (Chopra, 1938; Kitagawa, 1973; Long & Grolle, 1990); recently its known range in SE Asia has been extended in China (Fujian, Yunnan, Sichuan, Jiangxi, Zhejiang and Taiwan), Philippines and Sabah (Engel, 1987; Ji *et al.*, 1998; Zhu *et al.*, 1998).

**Cephaloziellaceae*****Cephaloziella capillaris* (Steph.) Douin**

**Nepal, East:** Taplejung District, Tamur River above Tawa, 27°29'N, 87°44'E, wooded river bank, on soil bank, 1100m, 2 ix 1989, *Long 16552*; det. Váňa.

**New to Nepal;** in Himalaya reported from Bhutan (Long & Grolle, 1990); elsewhere known from Thailand, Java, Celebes, Papua New Guinea and Samoa (Grolle, 1968; Kitagawa, 1969; Miller *et al.*, 1983).

***Cephaloziella magna* Udar & V. Nath**

**Nepal, East:** Taplejung District, lower slopes of Dobala Danda above Yamphudin, 27°27'N, 87°56'E, open cultivated slopes, on soil by water trough, 1810m, 26 ix 1989, *Long 17253*; det. Váňa.

**New to Nepal;** known previously only from the type from Almora, NW Himalaya of India (Udar & Nath, 1976).

**Delavayellaceae*****Delavayella serrata* Steph.**

**India, Sikkim:** West District, Chhurong Chhu Valley between Bakhim and Tsoka, 27°26'N, 88°11'E, mossy *Tsuga*/*Lithocarpus* forest, on shady log, 2960 m, 9 vii 1992, *Long 22466*; det. Long.

**New to Sikkim;** recorded in the Himalaya from NW Himalaya, Nepal, Darjeeling and Bhutan and elsewhere from China (Yunnan, Sichuan) and Thailand (Grolle, 1966; Hattori, 1967; Long & Grolle, 1990).

## Geocalyceae

### *Geocalyx graveolens* (Schrad.) Nees

**Nepal, East:** Sankhuwasabha District, upper slopes of E bank of Saldim Khola NW of Hatiya, 27°44'N, 87°18'E, *Tsuga/Rhododendron* forest, on boulder on mossy bank by side stream, 2905 m, 12 × 1991, *Long 21170-a*; det. Grolle.

**India, Sikkim:** West District, Chhurong Chhu Valley between Tsoka and Jamlinghang, 27°26'N, 88°10'E, *Abies densa/Rhododendron* forest, in mossy carpet under dripping rocks, 3175 m, 9 vii 1992, *Long 22478*; det. Long.

**New to Nepal and Sikkim;** reported from Himalaya (NW, Bhutan), Europe, Macaronesia, Soviet Union, Siberia, China (Hunan, Jilin, Yunnan), Japan and North America (Gao & Cao, 2000; Inoue, 1974; Long & Grolle, 1990; Piippo, 1990; Rao *et al.*, 1997; Schuster, 1980; Udari & Srivastava, 1983). See also comments under next species.

### *Geocalyx lancistipulus* (Steph.) S.Hatt.

**Nepal, East:** Taplejung District, E bank of Ghunsa Khola between Ghunsa and Rambuk Kharka, 27°41'N, 87°58'E; *Abies/Rhododendron* forest, on damp rocky slope, 3560 m, 9 ix 1989, *Long 16771*; Ghunsa Khola, Ghunsa, 27°40'N, 87°57'E, steep rocky riverbank with *Larix/Rhododendron* scrub, on soil bank, 3440 m, 8 ix 1989, *Long 16747*; det. Grolle.

**China, Yunnan:** Dali County, Tsang (Cang) Shan, Shu Ching Qan valley NW of Huadianba, steep gully in moist *Lithocarpus/Rhododendron sinogrande* forest, on wet rocks in stream, 2950 m, 17 × 1990, *Long 19249*; Zhongdian County, side valley 13 km N of Geza, 28°16'N, 99°45'E, small valley with mixed *Picea/Quercus* forest, on conifer log, 3315 m, 30 v 1993, *Long 23878*; Dêqên County, side valley between Dêqên and Mekong Valley, 28°28'N, 98°51'E, *Abies/Rhododendron* forest, on rotten log, 3390 m, 2 vi 1993, *Long 23968*; between Dêqên and Xiang Yang Po, 18 km S of Dêqên, 28°23'N, 98°54'E, valley with mixed conifer/ broad-leaved forest, on shady log on bank, 3245 m, 8 vi 1993, *Long 24166*; det. Long.

**New to Himalaya (Nepal) and China (Yunnan);** previously known only from Japan (Inoue, 1974).

All these collections show numerous upturned elongate gemmiparous shoots, bearing at their apex a cluster of pale green, 1-2-celled, ovoid to ellipsoid gemmae, exactly as described and figured by Inoue (1974) for Japanese *G. lancistipulus*. The two collections cited above as *G. graveolens* are completely lacking in gemmiferous shoots, exactly as in European and North American populations of *G. graveolens* (Müller, 1951-1958; Paton, 1999; Schuster 1980). It is noteworthy that the East Himalayan collections of *Geocalyx lancistipulus* are from higher elevations (Nepal 3440 m and Sikkim 3560 m) than those of *G. graveolens* (Bhutan 2800 m, Nepal 2905 and 3175 m). In Yunnan *G. lancistipulus* is recorded between 2950 and 3390 m. Schuster (1980) noted that in North America « *G. graveolens* fails to attain any high elevation, being rare or absent on the summits of our higher mountains ».

### *Lophocolea heterophylla* (Schrad.) Dumort. (= *Chiloscyphus profundus* (Nees) J.J.Engel & R.M.Schust.)

**Nepal, East:** Taplejung District, Omje Khola bridge, Yamphudin, 27°27'N, 87°55'E, rocky ravine, on tree trunk by river, 1720 m, 24 ix 1989, *Long 17229*; between Kunjuri and Pakora, 27°22'N, 87°50'E, steep cultivated valley, on *Castanopsis*, 1530 m, 1 × 1989, *Long 17461*; Terathum District, Tinjure Danda above Chauki,

27°10'N, 87°26'E, *Abies/ Rhododendron* forest, on log, 2900 m, 5 × 1989, *Long 17573*; det. Grolle.

**New to Nepal;** reported from Himalaya (NW, Bhutan), China and temperate Asia, Europe and America (Long & Grolle, 1990; Piippo, 1990; Schuster, 1980).

## Haplomitriaceae

### *Haplomitrium hookeri* (Sm.) Nees

**Nepal, East:** Taplejung District, Ghunsa Khola, Ghunsa, 27°40'N, 87°57'E, bouldery river bank, in damp hollows in sand, 3440 m, 8 ix 1989, *Long 16759*; confirmed and published by Bartholomew-Began (1991).

**India, Sikkim:** West District, E bank of Choktsering Chhu, Bikbari, 27°30'N, 88°08'E, flat silty stony area by river, on silty hollows amongst mosses, 3905 m, 13 vii 1992, *Long 22567*; West District, foot of E Rathong Glacier above Chaunrikhiang, 27°33'N, 88°07'E, open glacial valley, in gravelly hollows and damp bank by glacial outflow river, 4550m, 15 vii 1992, *Long 22608*; det. Long.

**New to Sikkim;** in the Himalaya reported previously from NW and Darjeeling, elsewhere widespread but local in cool temperate regions of the northern hemisphere (Bartholomew-Began 1991); reported from China (Yunnan, Sichuan) by Higuchi *et al.* (2000) and Siberia by Schuster & Konstantinova (1996).

As reported for the collection from Yunnan (Higuchi *et al.*, 2000), the ecology in the Himalayan localities shows strong similarities to populations in Scotland (Paton & Corley, 1969) and western North America (Worley, 1969), with a preference for sandy streambanks, glacial moraines and late-snow areas in alpine habitats. Associated bryophytes include *Aneura crateriformis* Furuki & D.G.Long, *Aongstroemia orientalis* Mitt., *Blepharostoma trichophyllum* (L.) Dumort., *Jungermannia lanigera* Mitt., *Lophocolea minor* Nees, *Lophozia decolorans* (Limpr.) Steph., *L. incisa* (Schrad.) Dumort. and *L. longidens* (Lindb.) Macoun.

## Jubulaceae

### *Jubula hutchinsiae* (Hook.) Dumort. subsp. *javanica* (Steph.) Verd.

**Nepal, Central:** Rasuwa District, S bank of Langtang Khola above Syabru, 28°08'N, 85°23'E, rocky slope in steep valley, on dripping rocks, 1670 m, 27 iv 1992, *Long 22130*; det. Grolle.

**Nepal, East:** Taplejung District, N-facing slopes of Dobala Danda above Kabeli Khola, 27°27'N, 87°56'E, steep valley in mossy oak/laurel forest, on dead twigs in gully, 2340 m, 27 ix 1989, *Long 17332*; *ibid.*, ravine in wet mossy oak/laurel forest, in mossy curtain amongst logs and rocks, 2350 m, 27 ix 1989, *Long 17362*; det. Grolle.

**New to Nepal;** in Himalaya reported from Sikkim, Darjeeling and Bhutan; elsewhere widespread throughout SE Asia and Malesia (Guerke, 1978; Long & Grolle, 1990).

## Jungermanniaceae

### *Scaphophyllum speciosum* (Horik.) Inoue subsp. *villosum* R.M. Schust.

**Nepal, East:** Sankhuwasabha District, E bank of Saldim Khola, below bridge, NW of Hatiya, 27°45'N, 87°17'E, mossy *Tsuga* forest, on mossy N-facing bank, 2900m, 12 × 1991, *Long 21155*; upper slopes of E bank of Saldim Khola, NW of Hatiya, 27°44'N, 87°18'E, *Tsuga/ Rhododendron* forest, on mossy bank by side stream, 2905m, 12 × 1991, *Long 21170-c*; det. Long.

**New to Nepal;** reported from Bhutan by Long & Grolle (1990); the Bhutan plants were distinguished from subsp. *speciosum* from Taiwan by Schuster (1998). The species has also been recorded from China (Yunnan, Xizang) by Fu *et al.* (1995) who reported the discovery of sporophytes.

As in Bhutan, *Scaphophyllum* in Nepal grows in a very sensitive mossy forest habitat which is very vulnerable to disturbance; associated species include *Plagiochila hyalodermica* Grolle & M.L.So, *Temnoma setigerum* (Lindenb.) R.M. Schust., *Delavayella serrata* Steph. and *Geocalyx graveolens* (Schrad.) Nees.

## Lepidoziaceae

### *Lepidozia flexuosa* Mitt.

**Nepal, East:** Taplejung District, descent from Buje Daurali to Nesum, Tamur Valley, 27°20'N, 87°35'E, mossy oak/*Rhododendron* forest, on soil bank, 2620m, 31 viii 1989, *Long 16512*; N-facing slopes of Dobala Danda above Kabeli Khola, 27°27'N, 87°56'E, ravine in wet mossy oak/laurel forest, on mossy boulders, 2350 m, 27 ix 1989, *Long 17379*; *ibid.*, 28 ix 1989, *Long 17424*; det. Grolle.

**New to Nepal;** in Himalaya known from Darjeeling, Sikkim, Bhutan, Arunachal Pradesh and Assam; also from Myanmar, Thailand and Philippines (Long & Grolle, 1990; Sharma & Srivastava, 1993).

## Lophoziaceae

### *Andrewsianthus ferrugineus* Grolle

**Nepal, East:** Taplejung District, between Tamo La and Sinion La, 27°37'N, 87°57'E, rocky stream on open slope, on dripping rocks, 4020m, 15 ix 1989, *Long 16971*; det. Grolle.

**India, Sikkim:** West District, between Thangshing and Lam Pokhari, E side of Prek Chu valley, 27°30'N, 88°11'E, open moorland with dwarf *Rhododendron*, on peaty boulder, 4070 m, 19 vii 1992, *Long 22694*; Prek Chhu Valley between Thangshing and Onglakthang, 27°32'N, 88°11'E, huge calcareous boulders on river bank, creeping over mosses on rock face, 4075 m, 21 vii 1992, *Long 22777*; det. Grolle.

**New to India and Sikkim;** endemic to East Himalaya, previously only known from a few localities in Nepal (Grolle, 1966; Noguchi *et al.*, 1966; Vána, 1974; Hattori, 1975; Miehe, 1990) and from western Bhutan (Long & Grolle, 1990).

### *Horikawaella grosse-verrucosa* Amak. & S. Hatt.

**Nepal, East:** Taplejung District, below N side of Sinion La, 27°35'N, 87°57'E, rocky valley, sandy ground amongst large boulders, 4250 m, 15 ix 1989, *Long 16985*; det. Grolle; Sankhuwasabha District, upper valley of tributary N of Barun Khola, NE of Pemathang Kharka, 27°45'N, 87°13'E, open rocky alpine valley, in shady mossy block scree, 4120m, 9 x 1991, *Long 21068*; det. Long.

Endemic to Nepal (Hattori, 1975); these records supplement the known distribution.

### *Lophozia decolorans* (Limpr.) Steph. (= *Isopaches decolorans* (Limpr.) H.Buch)

**Nepal, East:** Taplejung District, Ramtang, upper Ghunsa Khola, 27°45'N, 88°01'E, open rocky valley, bare soil on exposed boulders, 4500 m, 10 ix 1989, *Long 16829*; Lhonak to Pang Pema, Kangchenjunga Glacier, 27°47'N, 88°04'E, base of cliff, peaty crust on boulder, 4860 m, 11 ix 1989, *Long 16847*; *ibid.*, moraine ridge, on damp bank, 4850 m, 11 ix 1989, *Long 16856*; Sankhuwasabha District, upper Barun Khola valley, tributary valley below Peak 3, above Mera, 27°48'N, 87°08'E, 4510m,

2 × 1991, *Long* 20868; Upper Barun Khola valley, cliffs on S side of Lower Barun Glacier opposite Mera, 27°48'N, 87°07'E, base-rich slopes below cliffs, on dry soil-capped boulder, 4400 m, 3 × 1991, *Long* 20888; Makalu Base Camp, Barun Pokhari, 27°52'N, 87°05'E, exposed stable moraine, on bare soil amongst *Ephedra gerardiana*, 4725 m, 4 × 1991, *Long* 20948; Upper Barun Khola between Lower Barun Glacier and Repu Kharka, 27°47'N, 87°09'E, open valley with *Rhododendron* scrub, on peat overlying edges of stones in marsh, 4000m, 7 × 1991, *Long* 21020; det. Váňa and Long.

**India, Sikkim:** West District, E bank of Choktsering Chhu, Bikbari, 27°30'N, 88°08'E, flat stony area by river, on silt, 3905m, 13 vii 1992, *Long* 22566; foot of East Rathong Glacier above Chaunrikhiang, 27°33'N, 88°07'E, open glacial valley, on gravelly peaty bank above glacial river, 4560 m, 15 vii 1992, *Long* 22602; tributary of Prek Chhu opposite Lambi, N of Thangshing, 27°31'N, 88°11'E, bouldery gully, on flat gravelly ground amongst boulders, 4065 m, 20 vii 1992, *Long* 22733; North District, Yumthang, by Lachung Chhu, 27°48'08"N, 88°42'22"E, open flats by river, on damp gravelly ground, 3600m, 13 vii 1996, *Long* 26412; det. Váňa and Long.  
**China, Yunnan:** Dêqên County, Bai Ma Shan, mountains S of W pass, 28°23'N, 99°01'E, open mountain valley, on damp sandy ground by stream, 4300 m, 5 vi 1993, *Long* 24058; det. Long.

**New to India (Sikkim) and China (Yunnan);** in Himalaya reported from Nepal and Bhutan (Long, 1979; Váňa, 1982); elsewhere reported as a rare and disjunct species from Europe, Soviet Union (Russian Arctic, East Siberia and European Russia), African Mountains (Cameroon, Tanzania, Zaire), Canada and Argentina (Gradstein & Váňa, 1987; Váňa, 1982; Konstantinova *et al.*, 1992; Schäfer-Verwimp, 1996; Schuster, 1995; Schuster & Konstantinova, 1996; Wigginton & Grolle, 1996.)

These records suggest that *L. decolorans* may be a more widespread and locally abundant species in the East Himalaya and possibly also in Western China, than in other parts of its range (see Schuster & Konstantinova, 1996). It is characteristic of thin exposed soils in open alpine habitats, in thin crusts on top of boulders and rocks, on damp sandy ground by streams and on glacial moraines. In three of the above sites an associated liverwort was *Haplomitrium hookeri* (Sm.) Nees; other bryophyte associates included *Anthelia juratzkana* (Limpr.) Trevis., *Aongstroemia julacea* (Hook.) Mitt., *Aongstroemia orientalis* Mitt., *Gymnomitrium* spp., *Jungermannia* spp., *Marsupella commutata* (Limpr.) H.Bernet and *Reboulia hemisphaerica* (L.) Raddi.

### ***Lophozia longidens* (Lindb.) Macoun**

**Nepal, East:** Taplejung District, Ghunsa, stream above village 27°40'N, 87°57'E, mixed *Rhododendron* woodland, on log, 3500m, 8 ix 1989, *Long* 16715; Ghunsa Khola, Ghunsa, 27°40'N, 87°57'E, bouldery river bank, on damp sandy ground, 3440 m, 8 ix 1989, *Long* 16758; Yalung Valley near Lapsang, 27°34'N, 87°59'E, moraine ridge, on peaty slope, 4180 m, 20 ix 1989, *Long* 17085; Sankhuwasabha District, Pemathang Kharka, S side of Barun Khola, 27°44'N, 87°12'E, steep ravine in *Betula/Rhododendron* forest, on stone on mossy bank, 3420 m, 28 ix 1991, *Long* 20732; det. Grolle.

**New to Nepal;** in Himalaya reported from Sikkim and Darjeeling (Hattori, 1967); circumboreal but with few reports from Asia.

### ***Tritomaria quinquedentata* (Huds.) H.Buch**

**Nepal, East:** Sankhuwasabha District, Nehe Kharka, S side of Barun Khola, 27°45'N, 87°10'E, steep calcareous gully under huge cliffs, on stony soil slope,

3730 m, 30 ix 1991, *Long 20802*; upper Barun Khola Valley, cliffs on S side of Lower Barun Glacier opposite Mera, 27°48'N, 87°07'E, mossy hollow amongst boulders below baser-rich cliffs, 4415m, 3 × 1991, *Long 20900*; det. Long.

**New to Nepal and Himalaya**; circumboreal and quite widespread in China (Piippo, 1990).

***Tritomaria scitula* (Taylor) Jörg.**

**Nepal, East:** Taplejung District, Ghunsa, stream above village, 27°40'N, 87°57'E, open streamside, on gravel, 3500m, 8 ix 1989, *Long 16723*; det. Váňa.

**New to Nepal and Himalaya**; circumboreal but rarely recorded in Asia (Konstantinova *et al.*, 1992); not yet reported from China.

**Pseudolepicoleaceae**

***Temnoma setigerum* (Lindenb.) R.M.Schust.**

**Nepal, East:** Taplejung District, N-facing slopes of Dobala Danda above Kabeli Khola, 27°27'N, 87°56'E, steep valley in mossy oak/ laurel forest, in mossy curtain amongst logs and rocks, 2350 m, 27 ix 1989, *Long 17364*; Sankhuwasabha District, E bank of Saldim Khola, below bridge, NW of Hatiya, 27°45'N, 87°17'E, mossy *Tsuga* forest, on mossy N-facing bank, 2900 m, 12 × 1991, *Long 21158*; upper slopes of E bank of Saldim Khola, NW of Hatiya, 27°44'N, 87°18'E, *Tsuga/Rhododendron* forest, on mossy bank by side stream, 2905m, 12 × 1991, *Long 21170-b*; det. Long.

**New to Nepal**; in Himalaya known only from Bhutan; elsewhere scattered but rare in SE Asia and Oceania (Long & Grolle, 1990).

**Radulaceae**

***Radula caduca* Yamada**

**Nepal, East:** Taplejung District, Tamur River near Chirwa, 27°29'N, 87°46'E, open woodland on river bank, on wet rocks, 1350m, 3 ix 1989, *Long 16573*; lower slopes of Dobala Danda above Yamphudin, 27°27'N, 87°56'E, ravine in mixed broad-leaved forest, on sapling, 2100 m, 26 ix 1989, *Long 17303*; N-facing slopes of Dobala Danda above Kabeli Khola, 27°27'N, 87° 56'E, steep valley in mossy oak/ laurel forest, on mossy bank, 2340 m, 27 ix 1989, *Long 17338*; near Buje Daurali, 27°19'N, 87°34'E, mossy *Rhododendron* forest, on rock face, 2550 m, 4 × 1989, *Long 17511*; det. Grolle.

**New to Nepal**; known elsewhere from Bhutan, Thailand and Papua New Guinea (Long & Grolle, 1990; Yamada & Piippo, 1989).

***Radula ceylanica* Yamada**

**Nepal, East:** Taplejung District, Ghunsa, by second large waterfall above village, 27°40'N, 87°57'E, ravine in *Abies/Rhododendron* forest, on boulder, 3450m, 14 ix 1989, *Long 16895*; det. Grolle.

**New to Nepal**; known elsewhere only from Bhutan, Sri Lanka and the Malay Peninsula (Long & Grolle, 1990; Yamada, 1979).

**Scapaniaceae**

***Diplophyllum trollii* Grolle**

**Nepal, East:** Taplejung District, Ghunsa, by second large waterfall above village, 27°40'N, 87°57'E, ravine in *Abies/Rhododendron* forest, in dry crevice of boulder,

3450m, 14 ix 1989, *Long 16892*; Sankhuwasabha District, Upper Barun Khola Valley, tributary valley below Peak 3, above Mera, 27°48'N, 87°08'E, open rocky valley, on shady rock overhang on low cliff, 4460m, 2 × 1991, *Long 20865-b*; det. Long.

**India, Sikkim:** West District, Jamlinghang, Chhurong Chhu valley below Dzungri, 27°28'20"N, 88°09'14"E, steep rocky side-valley, on shady rock face, 3680m, 10 vii 1992, *Long 22515*; descent to Prek Chhu N of Dzungri, 27°30'N, 88°10'E, *Abies densa*/*Rhododendron hodgsonii* forest, on soil under overhanging rock, 3820 m, 18 vii 1992, *Long 22661-b*; tributary of Prek Chhu opposite Lambi, N of Thangshing, 27°31'N, 88°11'E, steep rocky ravine, in shady rock crevice near waterfall, 4225 m, 20 vii 1992, *Long 22749*; det. Long.

**China, Yunnan:** Dali County, Tsang (Cang) Shan, path below Longquan Peak, above Dali, *Abies/Rhododendron*/bamboo forest on exposed ridge, on shady rock face, 3510 m, 15 × 1990, *Long 19197*; Dêqên County, Bai Ma Shan, by logging road on N-facing slopes below W pass, 28°24'N, 98°58'E, logged scrubby *Abies/Rhododendron* forest, on crumbling shady rock face, 3840 m, 6 vi 1993, *Long 24093*; det. Long.

**New to China** (Yunnan); previously reported only from East Nepal, Sikkim and Bhutan (Grolle, 1966; Long & Grolle, 1990). The plants from Yunnan are slightly more robust than the Himalayan ones but show a consistently dioicous sexual condition and lacinate tooting of the perianth mouth.

**Acknowledgments.** The author would like to record his enormous gratitude to the late Riclef Grolle for constant encouragement and help with research on Himalayan Liverworts over many years and to Jiri Váňa (Prague) who has generously identified large numbers of Sino-Himalayan liverworts. The many friends and colleagues in Nepal, India, Bhutan and China are sincerely thanked for facilitating collecting expeditions over the past 25 years.

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