

Notes on Himalayan Hepaticae 3: New records and extensions of range for some Himalayan and Chinese Marchantiales¹

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(Received 28 October 2005, accepted 2 November 2005)

Abstract – New records are presented for 21 species of complex thalloid Hepaticae (Marchantiales) from the Sino-Himalayan region, collected mostly on expeditions from the Royal Botanic Garden, Edinburgh. New records are as follows: Nepal 3 species, Sikkim 6, Bhutan 6, Yunnan 4, Tibet 1, Qinghai 4 and Bangladesh 2. Most significant are many new records of the rare *Cryptomitrium himalayense*, extensions of range for *Exomorthea tuberculifera* eastwards to Bhutan, and *Sauteria spongiosa* to Yunnan. The widespread occurrence of the recently-described *Conocephalum salebrosum* is confirmed for the Sino-Himalayan region, and also for the three European subspecies of *Marchantia polymorpha* recorded for the first time from throughout the Himalayas and Western China, with similar ecological preferences as reported in Europe.

Hepaticae / Liverworts / Himalaya / India / Nepal / Sikkim / China / Yunnan / Qinghai

INTRODUCTION

Since 1975 the author has been able to collect hepaticae extensively in several parts of the Sino-Himalayan region, particularly Nepal, Sikkim, Bhutan, Yunnan and Qinghai. Amongst these collections are many specimens of Marchantiales, the group that the late Helène Bischler studied for most of her life and became the world authority. They include new records for individual countries and regions, and a selection of the more interesting ones is reported here. The main sources of these specimens are summarized as follows, with the year of the collections indicated:

1. India: Uttaranchal, 2002; West Bengal 1992; Sikkim 1992, 1996.
2. Nepal: Central 1992, 2001; East 1989, 1991.
3. Bhutan: 1975, 1979, 1982, 1999.
4. China: Yunnan 1990, 1993; Tibet 1993; Qinghai 1997.
5. Bangladesh: 1998.

1. The second part in this series was published in *Cryptogamie, Bryologie* 26: 97-107, 2005.

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Most of the specimens cited below were collected by the author and are deposited in the herbarium of the Royal Botanic Garden, Edinburgh (E). A few specimens from other collectors are included: D. Binns, C. Chadwell, D.F. Chamberlain R.J.D. McBeath, B.C. Tan and M.F. Watson. Specimens were determined by the author unless otherwise indicated. Normally only one specimen is cited for each regional geographical unit, except for rarer taxa where all specimens are listed.

Records have been checked against many floristic reports on Himalayan liverworts, particularly important are Grolle (1966, 1974), Hattori (1967, 1975), Long & Grolle (1990) and Noguchi *et al.* (1966). For China, distributions were checked against Piippo (1990), Piippo *et al.* (1998), Gao & Cao (2000), and Wu & Wang (2000). Author abbreviations follow Brummitt & Powell (1992).

RECORDS

Aytoniaceae

Asterella khasyana (Griff.) Pandé *et al.*

India, Sikkim: West District, tributary of Rathong Chhu, Tingdong near Gerathang SW of Yoksam, 27°21'N, 88°14'E, shady mixed broad-leaved forest, on damp rocky bank by road, 1510 m, 7 vii 1992, *Long 22412*; East District, Gangtok, 27°20'N, 88°37'E, on roadside wall in town, 1830 m, 30 vii 1992, *Long 22961*; North District, Bop, between Chungthang and Maltin, 27°33'08"N, 88°40'05"E, steep valley with patches of evergreen broad-leaved forest, on wet rocks by waterfall, 1960 m, 12 vii 1996, *Long 26380*.

New to Sikkim; widely distributed in the Himalayan region (Long & Grolle, 1990).

Asterella leptophylla (Mont.) Grolle

India, Sikkim: West District, Rathong Chhu Valley, between Prek Chhu and Bakhim, 27°25'N, 88°11'E, degraded *Quercus lamellosa* forest, on underside of boulder, 2710 m, 8 vii 1992, *Long 22459*; North District, east bank of Tista above Rabom, N of Chungthang, 27°39'N, 88°36'E, evergreen broad-leaved forest on steep slope, on rock face by road, 2370 m, 16 vii 1996, *Long 26503*.

New to Sikkim; widely distributed in the Himalayan region east to Japan (Long & Grolle, 1990). The earlier report from Sikkim (Long & Grolle, 1990) is based on a specimen from Darjeeling.

Asterella mussuriensis (Kashyap) Verd. *subsp. mussuriensis*

India, Sikkim: West District, Norbugang near Yoksam, 27°22'N, 88°13'E, on old wall of chorten, 1830 m, 28 vii 1992, *Long 22940*.

New to Sikkim; throughout Himalaya and SW China (Long & Grolle, 1990; Piippo, 1990).

Asterella wallichiana (Lehm. & Lindenb.) Grolle

Bangladesh: Chittagong District, Sitakunda, Chandranath Hill below temple, steep wooded hillside, on brickwork of wall, 150 m, 11 x 1998, *Long 28179*.

New to Bangladesh; widespread in India, Himalaya, China, Myanmar, Thailand, Japan (Long, in prep.).

***Cryptomitrium himalayense* Kashyap**

India, Uttarakhand: slope below Snow View ridge, Nainital, 29°23'44"N, 79°27'26"E, steep hillside with degraded *Quercus/Cedrus* woodland, on sloping rocks by path, 2140 m, 29 i 2002, *Long 30833*; slopes above Easy Laggan Road, Nainital, 29°23'07"N, 79°27'28"E, steep slopes with *Quercus* woodland, on shady rock face, 2045 m, 30 i 2002, *Long 30854*.

Nepal, Central: Makawanpur District, Pharping to Phakel, S. of Kathmandu, 27°35'N, 85°13'E, damp shady bank, clay soil, under shrubs, 1700 m, 28 ii 1996, *Watson 96.7a*; Rasuwa District, N bank of Langtang Khola above Syabru, 28°09'N, 85°25'E, dry rocky wooded river bank, on rocks, 2200 m, 23 iv 1992, *Long 22043*; Rasuwa District, Langtang Khola between Hot Springs and Bamboo Lodge, 28°09'N, 85°22'E, evergreen *Lithocarpus* forest on river bank, on shady rocks, 1700 m, 11 x 2001, *Long 30555*; Langtang Khola, north bank, below Lama Hotel, 28°09'28"N, 85°24'54"E, evergreen forest on steep slope, common on damp shady rocks, 2220 m, 11 x 2001, *Long 30559*; Langtang Khola between Lama Hotel and Gumnachok, 28°10'36"N, 85°26'28"E, *Tsuga/Quercus* forest, on shady soil bank under *Quercus semecarpifolia*, 2650 m, 12 x 2001, *Long 30572*.

India, Sikkim: West District, Jamlinghang, Chhurong Chhu valley below Dzongri, 27°28'20"N, 88°09'14"E, steep rocky side-valley, on soil under huge boulder, 3710 m, 10 vii 1992, *Long 22522*.

Bhutan: Thimphu District, slopes below Tangu Monastery, Thimphu Chu, 27°35'31"N, 89°38'32"E, *Quercus semecarpifolia* forest, on shady soil bank, 2900m, 20 ix 1999, *Long 28751*.

China, Yunnan: Lijiang County, below temple, Wen Bi Shan SW of Lijiang, open cultivated slope, on soil bank shaded by *Juglans* and *Populus*, 2670 m, 3 x 1990, *Long 18767*; Zhongdian County, Bi Ye Go valley, N of Yangtze Bridge at Lou Swang, small valley with damp bamboo and scrub, on shady bank by stream, 2895 m, 2 x 1990, *Long 18752*; Zhongdian County, Wong Shui River above gorge, N of Geza, 28°24'28"N, 99°46'09"E, cultivated river valley, on shady rock face under trees, 3060 m, 28 v 1993, *Long 23779*.

New to Nepal, Bhutan. *Cryptomitrium himalayense* appears to be an uncommon species in the Sino-Himalaya, with relatively few previous records from NW Himalaya, Sikkim and S. India (Mehra & Sokhi, 1977); it was reported as new to China from Sichuan (Hengduan Mountains) by Wang (1993). Gao & Lai (2003) first reported this species from Yunnan. The specimens *Long 30555* and *30572* were noted as having a strong fishy smell as in many *Asterella* species, but not previously reported in *Cryptomitrium*.

***Plagiochasma appendiculatum* Lehm. & Lindenb.**

China, Yunnan: Lufeng County, 3km W of Yipingloa, between Kunming and Dali, wooded valley with secondary scrub, on vertical soil bank by road, 1760m, 23 ix 1990, *Long 18470*; Dali County, Dali, grounds of old pagodas, on damp wall, 2000 m, 24 ix 1990, *Long 18483-a*; Kunming City, Xishan (Western Hills) Forest Park SW of Kunming, road to Sanqingge Temple, 25°04'N, 102°41'E, dry mixed forest on steep limestone slope, on shady rock face, 2150 m, 21 v 1993, *Long 23511*.

New to Yunnan; widespread throughout warmer regions of Africa and Asia from Arabia to India, Himalaya, Indo-China, China (Sichuan, Taiwan) and Philippines (Bischler, 1979).

***Plagiochasma japonicum* (Steph.) C.Massal.**

China, Yunnan: Zhongdian County, Haba, 27°22'28"N, 100°05'30"E, on walls and banks, 2700 m, 17 vi 1994, *McBeath s.n.*

China, Qinghai: Henan County, Ningmute Xiang, Huang He River valley, 43°29'01"N, 101°08'32"E, steep river bank in gorge, under *Berberis*, 3380 m, 16 vii 1997, *Long 27052*; Maqin County, near Xueshan Xiang, 34°47'40"N, 99°45'01"E, dry rocky valley with *Juniperus*, under *Potentilla* and *Juniperus*, 3630 m, 9 vii 1997, *Long 26929*; Tongde County, N bank of gorge of Huang He east of Radja, 34°40'25"N, 100°41'23"E, steep dry rocky slopes, in earthy rock crevices, 3310 m, 12 vii 1997, *Long 26970*.

New to Yunnan and Qinghai; in China reported from Gansu, Shaanxi, Hebei, Liaoning and Taiwan by Piippo (1990); also reported from Mongolia by Meinunger *et al.* (1991). In the past often treated as a synonym of the American *P. intermedium* Lindenb. & Gottsche, but treated as distinct by Bischler (1979); however not all asiatic records of the latter are referable to *P. japonicum*; some refer to *P. pterospermum* C.Massal. which is common in Yunnan.

***Plagiochasma pterospermum* C.Massal.**

Bhutan: Thimphu District, west bank of Thimphu Chu near Lanjupakha Bridge, Thimphu, 27°29'N, 89°38'E, roadside on river bank, on retaining wall, 2330 m, 8 ix 1999, *Long* 28578.

China, Qinghai: Chengduo County, near Zha-ran-long mountain pass, 10 km from bridge across Dong-tian River and Sepa River, 32°59'54"N, 97°19'16"E, small side valley, limey outcrop, shaded, 3750 m, 3 vii 1995, *Tan* 95-2063 (FH).

New to Bhutan and Qinghai. Reported from Pakistan, NW Himalaya, China (Sichuan, Shaanxi, Taiwan) by Bischler (1979) and from Yunnan by Piippo *et al.* (1998).

***Reboulia hemisphaerica* (L.) Raddi**

China, Qinghai: Henan County, Youganing, E of Henan, 34°40'41"N, 101°44'22"E, open valley floor, on turfy bank of calcareous flush, 3590 m, 14 vii 1997, *Long* 26979; Huzhu County, Jiading Xiang, Ningzi, Langshidanggou Valley, 36°55'20"N, 102°25'14"E, margin of *Betula/Picea* woodland, on bank, 2560 m, 23 vii 1997, *Long* 27182; Madoo County, Zhaorigen Shan near Huashixia, 35°07'N, 98°53'E, rocky limestone valley, on soil under rock overhang, 4310 m, 3 vii 1997, *Long* 26822; Maqen County, Jiang Ran Valley N of Dawu, 34°30'58"N, 100°13'14"E, open grazed valley, under *Potentilla* shrubs on steep bank of gully, 3740 m, 7 vii 1997, *Long* 26856; Zeku County, below Maixiu Forestry Centre, Langzhang Valley, 35°15'52"N, 101°53'37"E, steep rocky valley with *Picea* and *Juniperus* forest, on stream bank under shrubs, 3180 m, 7 vii 1997, *Long* 27061.

New to Qinghai; subcosmopolitan, widespread in China (Piippo, 1990) and throughout SE Asia; recently reported as new to Inner Mongolia (Bai & Zhao, 1996) and Xinjiang (Whittemore *et al.*, 1998).

Blasiaceae

***Blasia pusilla* L.**

Nepal, East: Taplejung District, Ghunsa Khola between Amjilassa and Kyapra, 27°37'N, 87°53'E, *Tsuga/Quercus/Rhododendron* forest, on wet cliff, 2600 m, 6 ix 1989, *Long* 16665-a; Sankhuwasabha District, Pemathang Kharka, S side of Barun Khola, 27°44'N, 87°12'E, cliffs at top of steep ravine, on damp gravel bank, 3580 m, 28 ix 1991, *Long* 20744; Upper Barun Khola between Lower Barun Glacier and Repu Kharka, 27°47'N, 87°09'E, open valley with *Rhododendron* scrub, on sandy slope by stream, 4000 m, 7 x 1991, *Long* 21019; tributary on SW side of Saldim Khola, NW of Hatiya, 27°45'N, 87°16'E, steep valley with *Abies/Tsuga/Rhododendron* forest, on damp gravelly slope by river, 2940 m, 11 x 1991, *Long* 21138-a.

India, Sikkim: North District, between Phunse and Yakche, N of Lachung, 27°44'07"N, 88°44'26"E, open streamside in degraded *Abies densa* forest, on sandy streamside, 3270 m, 14 vii 1996, *Long* 26437.

Bhutan: Thimphu District, slopes below Chelai La, Paro, 27°23'27"N, 89°23'55"E, *Pinus wallichiana* forest, on wet rocks by stream, 2655 m, 18 ix 1999, *Long* 28709.

New to Nepal, Sikkim and Bhutan; though widespread throughout temperate and arctic regions of Asia, Europe and N America, it appears to be surprisingly rare in the Himalaya, recorded in the past only from the NW Himalaya (Kashyap, 1929).

Cleveaceae***Sauteria spongiosa* (Kashyap) S.Hatt.**

China, Yunnan: Zhongdian County, Bai Ma Shan, mountains N of W pass, 28°23'N, 99°01'E, valley below limestone cliffs, turfy ledge on bank under *Juniperus*, 4440 m, 4 vi 1993, *Long 24012* (E, PC); det. Bischler.

New to Yunnan; reported from Pakistan, NW Himalaya and Nepal (Grolle, 1966; Furuki & Higuchi, 1995) and from Tibet by Wu & Wang (2000).

Conocephalaceae***Conocephalum japonicum* (Thunb.) Grolle (= *C. supradecompositum* (Lindb.) Steph.)**

India, Sikkim: North District, Bop, between Chungthang and Maltin, 27°33'08"N, 88°40'05"E, steep valley with patches of evergreen broad-leaved forest, on wet rocks by waterfall, 1960 m, 12 vii 1996, *Long 26374*.

New to Sikkim; reported from Nepal, Darjeeling, Bhutan, E Siberia, Soviet Far East, Kamchatka, Korea, Japan and eleven provinces of China (Duda, 1984; Gambaryan, 1992; Koponen *et al.*, 2000; Long, 1979; Noguchi *et al.*, 1966; Piippo, 1990; Yamada & Choe, 1997).

Although always freely gemmiferous, this species has a relatively restricted world distribution, and might be expected to spread more widely in future in Asia.

Conocephalum salebrosum* Szweykowski *et al.

India, Jammu & Kashmir: above Gulmarg, 2820 m, 28 viii 1983, *Chadwell B122*.

India, Himachal Pradesh: Lahul, Udaipur, Chimrat, rocks near waterfall, 3650 m, 10 viii 1990, *McBeath 2440*.

India, Uttarakhand: Nainital District, above Dhobi Ghat, N slope of Snow View, Nainital, 29°23'53"N, 79°28'05"E, steep valley in mossy oak/laurel/bamboo forest, on moist bank by path, 2100 m, 2 ii 2002, *Long 30975*.

Nepal, Central: Makawanpur District, Phakel, 27°35'N, 85°13'E, on damp rocks by stream in dense shade, 1900 m, 29 ii 1996, *Watson 96.8*.

Nepal, East: Sankhuwasabha District, near Repu Kharka, N side of Barun Khola, 27°46'N, 87°09'E, open valley, on bank of gully below cliffs, 3885 m, 1 x 1991, *Long 20835*; Taplejung District, ridge NE of Gupha Pokhari, 27°17'N, 87°32'E, mixed *Rhododendron* forest, on wet rocks, 2805 m, 25 x 1991, *Long 21548*.

India, West Bengal: Darjeeling District, Tenzing Rock near Roy Villa between Darjeeling and Lebong, 27°03'34"N, 88°16'37"E, cleared evergreen *Castanopsis* forest, on wet rocks by stream in gully, 2060 m, 6 vii 1992, *Long 22394*.

India, Sikkim: North District, Lasha Chhu valley, below Phaklung, 27°55'22"N, 88°35'08"E, steep rocky gully, under boulder in stream, 4560 m, 19 vii 1996, *Long 26552*.

Bhutan: Thimphu District, slopes below Tangu Monastery, Thimphu Chu, 27°35'N, 89°38'E, *Quercus semecarpifolia* forest, on wet rocks in stream, 2850 m, 20 ix 1999, *Long 28749-a*; Bumthang District, near Jakar Dzong, 27°32'N, 90°45'E, hillside with *Pinus wallichiana*, on wall by stream, 2585 m, 11 ix 1999, *Long 28588*; Punakha District, E side of Dochu La, E of Thimphu, 27°29'N, 89°45'E, mossy *Tsuga dumosa* forest, wet rocks in shady ravine, 2950 m, 15 v 1979, *Long 7892*; Tongsa District, west slopes of Yuto La, E of Tongsa, 27°31'N, 90°34'E, moist *Tsuga/Rhododendron* forest, on wet rocks by waterfall, 3120 m, 8 vi 1979, *Long 8254*.

China, Yunnan: Dali County, Tsang (Cang) Shan, Shu Ching Qan valley NW of Huadianba, deep valley with *Lithocarpus/Rhododendron sino-grande* forest, on dripping rock face by stream, 2950 m, 17 x 1990, *Long 19255*; Dêqên County, 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 bank by stream, 3180 m, 8 vi 1993, *Long 24153*; Lijiang County, Yulong Shan, head of valley above Baishui, N of Lijiang, steep limestone valley, on wet shady bank, 3150 m, 7 x 1990, *Long 18910*; Weixi County, W side of Litiping Plateau, 27°09'07"N, 99°24'36"E, ravine in degraded *Acer*/ bamboo mixed forest, on shady bank, 3125 m, 18 vi 1993, *Long 24543*; Zhongdian County, forested ridge above Na Pa Hai, N of Zhongdian, 27°55'N, 99°34'E, steep limestone valley in *Abies*/*Rhododendron* forest, in soil crevices on rock face, 3780 m, 12 vi 1993, *Long 24258*.

China, Qinghai: Henan County, Xiawate, Zhihoumao Xiang S of Henan, 34°31'20"N, 101°31'13"E, steep rocky limestone hillside, in damp mossy clefts, 3850 m, 15 July 1997, *Long 27028*; Huzhu County, Baishuxia (Juniper) Pass, 37°00'23"N, 102°10'40"E, steep slope with *Rhododendron*, *Salix* & *Potentilla* scrub, on shady bank of gully, 3520 m, 22 vii 1997, *Long 27142*; Maqin County, Jiang Ran Valley N of Dawu, 34°31'17"N, 100°13'06"E, steep rocky valley slope with *Salix* scrub, on damp soil under rock, 3730 m, 7 vii 1997, *Long 26881*; Tongren County, Shuangpenxi Xiang, Kuohelongwa Valley, 35°32'42"N, 102°13'55"E, steep valley slope with *Picea* forest, under rocks at foot of cliff, 3030 m, 19 vii 1997, *Long 27120*; Xianghai County, north slope of Heka Shan, 35°50'02"N, 99°55'21"E, steep hillside with *Caragana*, on shady soil under rock, 3845 m, 2 vii 1997, *Long 26805*.

In the past the two species of *Conocephalum* reported from the Sino-Himalayan region were *C. conicum* (L.) Dumort. and *C. japonicum* (Thunb.) Grolle. Recently a third species *C. salebrosum* was segregated from *C. conicum* by Szweykowski *et al.* (2005) on the basis of isozyme differences supported by a suite of subtle morphological characters. *C. conicum* *s.str.* is now considered to occur only in Europe, as far east as the Caucasus mountains. For *C. salebrosum* the distribution is incompletely known, reported from Europe, North America, and East Asia (Himalaya, China and Japan). However, only three specimens from the Sino-Himalaya were cited by Szweykowski *et al.* (2005), from India (Darjeeling) and China (Sichuan). The specimens cited above confirm the widespread distribution of the segregate species in the Sino-Himalayan region, and it is therefore probably safe to deduce that most previous records of *C. conicum* from the region can be referred to *C. salebrosum*. The genus *Conocephalum* is new to Qinghai Province of China.

Cyathodiaceae

Cyathodium cavernarum Kunze

Nepal, Central: Kathmandu District, Swayambunath Temples, on soil bank under shrubs, 1400 m, 4 x 1999, *Long & N. Pradhan 28918*; Lalitpur District, Godaveri Botanical Garden, 27°35'53"N, 85°22'58"E, on shady brick wall in garden, 1490 m, 19 ix 2001, *Long 30252*; Rasuwa District, between Trisuli Khola and Dimsa, 28°06'04"N, 85°19'44"E, steep *Pinus*/*Quercus* forest, on damp shady soil bank, 2220 m, 5 x 2001, *Long 30373*.

Bangladesh: Chittagong District, Chittagong University Botanic Garden, open damp shady stonework under trees, 50 m, 6 x 1998, *Long 28075*; Rangamati District, Chandraghora, below Kaptai, 22°30'28"N, 92°08'45"E, open cleared hillside, on damp rock face by road, 120 m, 8 x 1998, *Long 28118*; Cox's Bazar District, Himchari National Park area, Barachara, 21°22'N, 92°04'E, gully in degraded subtropical scrub, on shady rock face under shrubs, 10 m, 15 x 1998, *Long 28242*.

New to Nepal and Bangladesh: widespread in Southeast Asia, Africa and South and Central America (Srivastava & Dixit, 1996). Hadiuzzaman & Chakravarty (1981) reported only one species of *Cyathodium* from Bangladesh, *C. tuberosum* Kashyap. However, their description and illustration of Bangladesh material with naked involucre and baculate spores suggest that their records may refer to *C. cavernarum* which would appear to be the common species of the genus in the Chittagong Hill Tracts area of Bangladesh. Srivastava & Dixit (1996) did not record any species of *Cyathodium* from Bangladesh.

***Cyathodium tuberosum* Kashyap**

Nepal, East: Taplejung District, lower slopes of Dobala Danda above Yamphudin, 27°27'N, 87°56'E, ravine in wet mossy oak/ laurel forest, on mossy boulder, 1810 m, 26 ix 1989, *Long* 17255; Sankhuwasabha District, forested slopes above Tashigaon, 27°37'N, 87°14'E, shady *Quercus lamellosa* / laurel forest, on wet rock face, 2470 m, 24 ix 1991, *Long* 20559.

Bhutan: Thimphu District, Drugyel Dzong, Paro Chu, 27°30'11"N, 89°19'24"E, rocky bank with shrubs, on soil in rock crevices, 2650 m, 18 ix 1999, *Long* 28697; Thimphu District, slopes below Tangu Monastery, Thimphu Chu, 27°35'N, 89°38'E, *Quercus semecarpifolia* forest, on shady rocks, 2850 m, 20 ix 1999, *Long* 28745; Punakha District, Mo Chu valley below Tashithang, 27°44'20"N, 89°44'37"E, wet evergreen broad-leaved forest, on wet rocks by road, 1600 m, 26 ix 1999, *Long* 28800.

New to Bhutan. The Nepal records supplement the only previous report, from Central Nepal (Furuki & Higuchi, 1995), otherwise reported from India, Himalaya (NW, Darjeeling, Sikkim) and Myanmar by Srivastava & Dixit (1996).

Exormothecaceae***Exormotheca tuberifera* Kashyap**

Bhutan: Thimphu District, E side of Phume La, 27°29'34"N, 89°33'03"E, open rocky hill-side, on earthy banks. 4120 m, 29 ix 1999, *Long* 28886.

New to Bhutan: reported from NW Himalaya, Nepal and South India (Hattori, 1975).

Marchantiaceae***Marchantia paleacea* Bertol. subsp. *paleacea***

China, Tibet: Mankang County, Yanjing District, Mu Xi, W bank of Mekong River, 28°47'44", 98°39'29"E, cultivated slope in village, on damp streamside, 2310 m, 3 vi 1993, *Long* 23996.

New to Tibet; widespread in Eastern Asia (Bischler-Causse, 1989; Piippo, 1990).

***Marchantia polymorpha* L. sensu lato**

Traditionally the *Marchantia polymorpha* complex has comprised three taxa, variously recognised at specific, subspecific and varietal rank in the past. Bischler-Causse (1989) revised the genus *Marchantia* for Asia and reported *M. polymorpha* s.l. from many countries, including Bhutan, China, India, Pakistan and Nepal. These records were not apportioned to any segregates. However, in Europe, Bischler-Causse & Boisselier-Dubayle (1991), Bischler-Causse (1993), Long (1995) and Paton (1999) have applied a more precise circumscription of the segregates into three subspecies. One of these, subsp. *ruderalis*, was reported by Bischler-Causse (1993) from Nepal (*Long* 17564) and Yunnan (*Long* 19256). These subspecies approximately follow the traditional segregation as species but many literature records cannot be reliably equated with the modern subspecies. However it now appears that the same three subspecies accepted in Europe also occur quite widely in the Sino-Himalaya.

***Marchantia polymorpha* L. subsp. *polymorpha* (= *M. aquatica* auct.)**

China, Yunnan: Zhongdian County, Ge Zao area, 12 km N of Zhongdian, open swampy valley floor, on wet peaty soil by ditch, 3430 m, 29 ix 1990, *Long* 18661; Zhongdian County, between Geza and Xia Geza, 28°05'48" N, 99°45'55"E, steep wooded river bank, on wet

stony/ sandy ground by river, 3100 m, 31 v 1993, *Long 23902*; Zhongdian County, Tian Shu Lake above Xiaozhongdian, 27°37'N, 99°38'E, swampy lake shore, on wet lake margin, 3890 m, 13 vi 1993, *Long 24321*.

China, Qinghai: Henan County, Xiawate, Zhihoumao Xiang S of Henan, 34°31'20"N, 101°31'13"E, steep rocky limestone hillside, in damp mossy clefts, 3850 m, 15 vii 1997, *Long 27027*; Huzhu County, Jiading Xiang, upper Gangzigou Valley, 36°45'N, 102°37'E, *Juniperus/Betula* woodland, in shady calcareous flush, 2885 m, 25 vii 1997, *Long 27278*.

***Marchantia polymorpha* L. subsp. *montivagans* Bischl. & Boisselier** (= *M. alpestris* auct.)

Pakistan: Upper Swat, Lake Mahodand, on mud at edge of slow-moving stream, 2710 m, 1994, *Binns 340*.

Nepal, East: Sankhuwasabha District, Nehe Kharka, S side of Barun Khola, 27°45'N, 87°10'E, open valley floor, on marshy ground by stream, 3680 m, 30 ix 1991, *Long 20820*; Sankhuwasabha District, Upper Barun Khola between Lower Barun Glacier and Repu Kharka, 27°47'N, 87°09'E, open valley with *Rhododendron* scrub, in wet flush by stream, 4050 m, 7 x 1991, *Long 21017*.

Bhutan: Bumthang District, small valley near Byakar Dzong, 27°33'N, 90°43'E, open valley with scrub, in damp turf by stream, 2750 m, 9 vi 1979, *Long 8274*.

China, Yunnan: Zhongdian County, Bai Ma Shan, below east pass, 28°20'N, 99°05'E, open streamside, in damp flush, 3945 m, 9 vi 1993, *Long 24201*.

***Marchantia polymorpha* L. subsp. *ruderalis* Bischl. & Boisselier**

India, Himachal Pradesh: Lahul, Udaipur, under rocks near stream, 3100 m, 2 viii 1990, *McBeath 2297, 2298*; Lahul, Udaipur, Chimrat, rocks near waterfall, 3650 m, 10 viii 1990, *McBeath 2428*.

Nepal, East: Terathum District, Phedi, above Chauki 27°11'N, 87°28'E, on wall in village, 2690 m, 5 x 1989, *Long 17564*.

India, Sikkim: West District, Tsoka, E slope of Chhurong Chhu valley, 27°26'N, 88°11'E, on wall in village, 3025 m, 9 vii 1992, *Long 22468*; East District, Gangtok, 27°20'N, 88°37'E, on roadside wall in town, 1795 m, 30 vii 1992, *Long 22960*; North District, Lasha Chhu valley, below Phaklung, 27°55'22"N, 88°35'08"E, open stony hillside, on boulder in stream, 4440 m, 19 vii 1996, *Long 26543*.

Bhutan: Chukka District, Chasilakha, 26°57'N, 89°34'E, on shady footpath in garden, 2000 m, 22 ii 1982, *Long 10451*; Thimphu District, above Motithang, Thimphu, by stream, 2450 m, 8 vi 1975, *Grierson & Long 88*; Pangri Zampa, Thimphu Chu, 27°32'N, 89°38'E, marshy ground in paddy field, 2350 m, 11 v 1979, *Long 7823*.

China, Yunnan: Kunming City, Kunming Botanic Garden, on paving slabs in greenhouse, 1960 m, 22 ix 1990, *Long 18442*; Dali County, Tsang (Cang) Shan, Shu Ching Qan valley NW of Huadianba, deep valley with *Lithocarpus/Rhododendron sino-grande* forest, on remains of old kiln by stream, 2960 m, 17 x 1990, *Long 19256* (E, PC); Zhongdian County, Xia Geza, by Liutung He River, 28°04'20"N, 99°46'15"E, scrub on river bank, on wet silty rocks by river, 3095 m, 26 v 1993, *Long 23703*; Weixi County, Weixi, guest house, 27°10'52"N, 99°17'27"E, on shady earth bank behind kitchen, 2350 m, 19 vi 1993, *Long 24509*.

China, Qinghai: Henan County, Xiawate, Zhihoumao Xiang S of Henan, 34°31'20"N, 101°31'13"E, steep rocky limestone hillside, in damp mossy rock clefts, 3850 m, 15 vii 1997, *Long 27024*.

It would appear that in the Sino-Himalaya subsp. *ruderalis* is the most widespread and abundant, and as in Europe is characteristic of disturbed or man-made habitats, whilst the other two species are much more restricted in distribution and often in more natural habitats. Revision of a wider range of material is desirable.

***Preissia quadrata* (Scop.) Nees**

China, Yunnan: Zhongdian County, Da Xue Shan, N of Geza, ridge 3 km W of pass, 28°34'N, 99°48'E, jagged limestone ridge, in damp cleft of shady cliff, 4380 m, 29 v 1993,

Long 23838; Zhongdian County, between Benzilan and Bai Ma Shan pass, 28°16'20"N, 99°11'13"E, steep rocky valley with mixed forest, on damp bank by stream, 3080 m, 10 vi 1993, Long 24222; Gongshan County, Salween Valley, W bank of Nu Jiang, 10 km N of Gongshan, lime-rich roadside bank, × 1997, *Chamberlain s.n.*

China, Qinghai: Maqen County, Yangkao, 34°42'58"N, 99°40'34"E, steep limestone side valley; on bank under *Salix*, 3845 m, 9 vii 1997, Long 26918; Henan County, Ningmute Xiang, Ningmute, 34°29'40"N, 101°10'09"E, steep river bank with *Juniperus*, under *Sibiraea*, 3440 m, 16 vii 1997, Long 27054; Zeku County, below Maixiu Forestry Centre, Langzhang Valley, 35°15'52"N, 101°53'37"E, steep rocky valley with *Picea* and *Juniperus* forest, on stream bank under shrubs, 3180 m, 17 vii 1997, Long 27060; Huzhu County, near Nanzhangzhagou Village, upper Zhalonggou Valley, 36°45'N, 102°32'E, *Betula/ Juniperus* woodland on limestone, on shady limestone bank, 2750 m, 24 vii 1997, Long 27227; Menyuan County, Zhugu Xiang, Dongxü Village, 37°07'08"N, 102°18'59"E, steep rocky hillside above river, on ledges, 2510 m, 26 vii 1997, Long 27296.

New to Qinghai; circumboreal but with few reports from China (Jilin, Taiwan, Yunnan and Xinjiang) (Piippo, 1990; Whittemore *et al.*, 1998; Gao & Lai, 2003).

Wiesnerellaceae

Dumortiera hirsuta (Sw.) Nees

India, Sikkim: West District, Rathong Chhu Valley, E bank of Prek Chhu below Bakhim, 27°25'N, 88°11'E, wet mossy *Quercus lamellosa* forest, on shady wet bank, 2400 m, 8 vii 1992, Long 22451; between Tsong (Chong) and Yoksam, 27°21'N, 88°14'E, steep valley with Cardamom plantations, on damp bank, 1750 m, 28 vii 1992, Long 22955; East District, S bank of Rate Chhu N of Gangtok, 27°23'N, 88°37'E, steep river valley, on wet dripping rocks, 1630 m, 31 vii 1992, Long 22986; East District, Deorali Sanctuary below Gangtok, 27°18'28"N, 88°36'35"E, *Schima/ Castanopsis* woodland, on damp shady bank, 1580 m, 9 vii 1996, Long 26320.

New to Sikkim; in Himalaya recorded from NW, Nepal and Darjeeling; elsewhere throughout tropics, subtropics and warm temperate regions (Long & Grolle, 1990).

Wiesnerella denudata (Mitt.) Steph.

Bhutan: Thimphu District, slopes below Tangu Monastery, Thimphu Chu, 27°35'N, 89°38'E, *Quercus semecarpifolia* forest, on wet rocks in stream, 2850 m, 20 ix 1999, Long 28749-b; Tongsa District, near Pertimi south of Shanggong, 27°13'N, 90°41'E, warm broad-leaved forest, on wet rocks, 1400 m, 3 iv 1982, Long 10767.

New to Bhutan; widespread in East and SE Asia, including NW Himalaya, Nepal, Sikkim and Darjeeling (Hattori, 1967, 1975; Piippo, 1988). Long 10767 was erroneously reported as *Conocephalum conicum* by Long & Grolle (1990).

Acknowledgments. The author wishes to acknowledge the huge contribution made to the knowledge of Marchantiales in the Sino-Himalaya by the late Helene Bischler, as well as her generosity in studying many specimens collected by the author. David Binns, Chris Chadwell, David Chamberlain, Ron McBeath, Benito Tan and Mark Watson are thanked for supplying additional material.

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