



Lichen family *Graphidaceae* in Arunachal Pradesh, India

G. Swarnalatha

Botanical Survey of India, Deccan Regional Centre, Hyderabad - 500048, Telangana, India

ARTICLE INFO

Article history:

Received : 07 December 2016
Accepted : 19 December 2016

Keywords:

Graphidoid *Graphidaceae*,
Lichenized Ascomycota
Taxonomy
Thalloloma hypoleptum

ABSTRACT

The present paper enumerates a total of 78 species of lichen family *Graphidaceae* (Graphidoid *Graphidaceae*) spread over 16 genera from the Indian state of Arunachal Pradesh, which is part of Himalaya Biodiversity Hotspot. Of these, one species, *Thalloloma hypoleptum* (Nyl.) Staiger is reported as new distributional record for India.

© 2016 Orissa Botanical Society

1. Introduction

Arunachal Pradesh, the land of rising sun, formerly known as NEFA (North Eastern Frontier Agency), is situated in the extreme north-eastern corner of India and lies between 91°30' E to 97°30' E longitude and 26°28' N to 29°30' N latitude. It is a part of Himalaya Biodiversity Hotspot, covering an area of 83,743 sq. km with the altitude ranging from 100 m to 7,090 m above mean sea level. As a part of the revisionary studies on family *Graphidaceae* in India, about 270 voucher specimens of family *Graphidaceae* collected from Arunachal Pradesh and deposited in various Indian herbaria (BSA, ASSAM, LWG) were studied by the author during December 2007 and March 2012. Based on the study, previously 65 species of *Graphidaceae* were reported from the state (Singh and Swarnalatha 2011a, b; Singh *et al.*, 2011). Extension of the earlier work revealed that some more taxa were identified and now 78 species of Graphidoid *Graphidaceae* belonging to 16 genera are known from Arunachal Pradesh. The species of Graphidoid *Graphidaceae* studied from Arunachal Pradesh in this work are enumerated in this paper; the names have been taxonomically reviewed/validated, with the distribution being updated. The species, *Thalloloma hypoleptum* (Nyl.) Staiger, is now reported as new for India. All the identified taxa are

enumerated here citing the complete list of specimens examined.

2. Materials and Methods

This study is based on the specimens collected from different localities of Arunachal Pradesh and deposited in herbarium at Botanical Survey of India, Eastern Regional Centre, Shillong (ASSAM), Botanical Survey of India, Central Regional Centre, Allahabad (BSA) and National Botanical Research Institute, Lucknow (LWG). All the specimens cited in this paper were studied at the Lichen Laboratory, Botanical Survey of India, Central Regional Centre, Allahabad, during December 2007 to March 2012.

The morphological features of the thalli and ascocarps were studied under stereo zoom microscopes (Olympus SZ51 and Nikon SMZ1500) and anatomical characters were examined with compound microscopes (Magnüs MLX-Tr and Leica DM2500). All anatomical measurements were made in water mounts. Colour spot tests were performed by using K, C and PD reagents. The lichen substances were identified by Thin Layer Chromatography (TLC) by using solvent system A, following White and James (1985). All specimens were examined under UV light (365 nm). The methodology and the concept of Staiger (2002) and Lücking and Rivas Plata (2008) have been followed here.

✉ Corresponding author; Email: swarnalathaginnaram@gmail.com

3. Enumeration of Taxa

Carbacanthographis marcescens (Fée) Staiger & Kalb, *Biblioth. Lichenol.* 85: 109. 2002.

Specimens examined: Arunachal Pradesh: Upper Subansiri District, Daporizo-Taliha Road, 6 km from Daporizo, alt. c. 300 m, 15 Jan. 1983, *K.P. Singh* 3043B (ASSAM); West Siang District, Kabu forest near Kabu village, 14 Mar. 2006, *U. Dubey* 07-009098 (LWG).

Diorygma hieroglyphicum (Pers.) Staiger & Kalb, in Staiger, *Biblioth. Lichenol.* 85: 151. 2002.

Specimens examined: Arunachal Pradesh: Tirap District, Near Dirok river, 14 km Deomals, 24 Feb. 1982 *K.P. Singh* 834 (ASSAM); Upper Subansiri District, Daporizo-Taliha Road, 6 km from Daporizo, alt. c. 300 m, 15 Jan. 1983, *K.P. Singh* 3043 (ASSAM); Daporizo-Zero Road, 2 km from Daporizo, on *Terminalia* tree, alt. c. 300 m, 16 Jan. 1983, *K.P. Singh* 3094B (ASSAM); Lohit District, Namsai, Near Peyong village, alt. c. 180 m, 30 Dec. 1983, *K.P. Singh* 4160B (ASSAM); Namsai, Lathauo Coffee Plantations, on *Dipterocarpus* tree, 30 Dec. 1983, *K.P. Singh* 4187A & B (ASSAM); West Kameng District, Near Dedza bridge, Bahlukpong-Tanga Road, alt. c. 1216 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4854 (BSA); West Kameng District, 10.5 km to Nechipu, Tanga-Bhalukpong Road, alt. c. 1184 m, 07 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5168 (BSA).

Diorygma junghuhnii (Mont. & Bosch) Kalb, Staiger & Elix, *Symb. Bot. Upsal.* 34(1): 157. 2004.

Specimens examined: Arunachal Pradesh: Upper Subansiri District, Daporizo-Zero Road, 2 km from Daporizo, on *Terminalia* plantations, 16 Jan. 1983, *K.P. Singh* 3087 (ASSAM); Taliha-Nachoo foot track, alt. c. 400 m, 19 Jan. 1983, *K.P. Singh* 4082 (ASSAM); Lohit District, Namsai, Near Peyong village, alt. c. 180 m, 30 Dec. 1983, *K.P. Singh* 4160 & 4170 (ASSAM); Lower Subansiri District, Near Kimin, alt. c. 400 m, 21 Jan. 1984, *K.P. Singh* 5067 (ASSAM); Lower Dibang Valley District, Mehao Wild Life Sanctuary, Sally lake, alt. c. 500 m, 31 Oct. 2002, *P.K. Dixit* 279D (BSA); Mehao Wild Life Sanctuary, Sally lake, alt. c. 390–400 m, 07 Nov. 2002, *K.P. Singh & P.K. Dixit* 451B & 461A (BSA); Mehao Wild Life Sanctuary, Abengo-Cornuway, alt. c. 500 m, 08 Nov. 2002, *K.P. Singh & P.K. Dixit* 495A (BSA); West Kameng District, Bhalukpong, Kameng river bank, alt. c. 220–229 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4628, 4629 & 4632 (BSA); Tipi Orchidarium, alt. c. 171 m, 02 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4732, 4733 & 4734 (BSA); Tipi, Near Neychiung festival ground, alt. c. 160 m, 02 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4736, 4763 & 4754 (BSA);

Near Dedza bridge, Bahlukpong-Tanga Road, alt. c. 1216 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4834 & 4836 (BSA); 10.5 km to Nechipu, Tanga-Bhalukpong Road, alt. c. 1184 m, 07 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5152 & 5163 (BSA); Tipi forest rest house campus, alt. c. 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5186, 5187, 5207, 5208, 5213, 5220, 5221, 5239 & 5240 (BSA).

Diorygma longilirellatum B.O. Sharma & Makhija, *Mycotaxon* 109: 212. 2009.

Specimens examined: Arunachal Pradesh: West Kameng District, near Dedza bridge, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4825 & 4845 (BSA).

Diorygma megasporum Kalb, Staiger & Elix, *Symb. Bot. Upsal.* 34(1): 160. 2004.

Specimens examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Sally Lake, alt. c. 500 m, 12 Nov. 2000, *K.P. Singh & P. Bujarbarua* 10878 (ASSAM); Mehao Wild Life Sanctuary, Roing Mini Zoo Area, 20 Nov. 2000, *K.P. Singh & P. Bujarbarua* 11082 (ASSAM); Mehao Wild Life Sanctuary, Mehao Lake, alt. c. 1550–1700 m., 15 Nov. 2002, *K.P. Singh & P.K. Dixit* 580D, 598C & 605A (BSA); West Kameng District, Sessa Orchid Sanctuary, alt. c. 1033–1170 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha*, 4699, 4720 & 4727 (BSA); West Kameng, Near Dedza bridge, Bahlukpong-Tanga Road, alt. c. 1216 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4846, 4847, 4852A/B/C, 4856, 4857 & 4860 (BSA); 10.5 km to Nechipu, Tanga-Bhalukpong Road, alt. c. 1184 m, 07 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5164, 5167, 5169 & 5170 (BSA); Tipi forest rest house campus, alt. c. 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5184 (BSA).

Diorygma pachygraphum (Nyl.) Kalb, Staiger & Elix, *Symb. Bot. Upsal.* 34(1): 163. 2004.

Specimen examined: Arunachal Pradesh: West Kameng District, Bhalukpong to Tanga road, near dedza bridge, alt. c. 1216 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4831 (BSA).

Diorygma pruinosum (Eschw.) Kalb, Staiger & Elix, *Symb. Bot. Upsal.* 31(1): 166. 2004.

Specimen examined: Arunachal Pradesh: Upper Subansiri, Daporizo-Zero Road, 2 km from Daporizo, on *Terminalia* plantations, alt. c. 300 m, 16 Jan. 1983, *K.P. Singh* 3094A (ASSAM).

Diorygma radiatum (D.D. Awasthi & S.R. Singh) *Kr.P. Singh & Swarnalatha*, *Indian J. Forest.* 32 (1): 179. 2009.

Specimen examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Roing mini zoo, 24 Apr. 2000, *K.P. Singh* 11087 (ASSAM).

Dyplolabia afzelii (Ach.) A. Massal., Neagen. Lich.: 6. 1854b.

Specimen examined: Arunachal Pradesh: Lohit District, Namsai, Near Peyong basti, alt. *c.* 150 m, 30 Dec. 1983, *K.P. Singh* 4174 (ASSAM).

Fissurina subcontexta (Nyl.) Nyl., Lich. Nov. Zeland.: 125. 1888a.

Specimen examined: Arunachal Pradesh: Lower Debang Vally District, Roing, Near ITI, alt. *c.* 400 m, 07 June 1984, *D.K. Upreti* L81796 (LWG).

Glyphis cicatricosa Ach., Syn. Meth. Lich.: 107. 1814.

Specimens examined: Arunachal Pradesh: West Siang District, Along, Bahadur Reserve forest alt. *c.* 375 m, 2 Jan. 1983, *K.P. Singh* 2596 (ASSAM); Lohit District, Hayuliang Inspection Bunglow Compound, alt. *c.* 600 m, 04 Jan. 1984, *K.P. Singh* 4279A/C (ASSAM); Lower Subansiri District, fozali to fanhu road, alt. *c.* 1000 m, 22 Jan. 1984, *K.P. Singh* 5153B (ASSAM); West Kameng District, Near Dedza bridge, Bahlukpong-Tanga Road, alt. *c.* 1216 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4861 (BSA); Near Dedza bridge, Bahlukpong-Tanga Road, alt. *c.* 1095 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4798 (BSA); Near Dedza bridge, Bahlukpong-Tanga road, alt. *c.* 1216 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4863 (BSA); Dirang, 2 km to Santhi Vally, alt. *c.* 1601 m, 06 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5046 (BSA); Dirang, Near Khopathar bridge, alt. *c.* 1575 m, 06 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5072, 5075 (BSA); 10.5 km to Nechipu, Tanga-Bhalukpong Road, alt. *c.* 1184 m, 07 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5171 (BSA); Dirang, Near NRCY, alt. *c.* 1700–2000 m, 04 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5359 (BSA).

Glyphis scyphulifera (Ach.) Staiger, Biblioth. Lichenol. 85: 175. 2002.

Specimens examined: Arunachal Pradesh: Lohit District, Hayuliang Inspection Bunglow Conpound, alt. 600 m, 04 Jan. 1984, *K.P. Singh* 4279B (ASSAM); West Kameng District, Bhalukpong, Kameng river bank, alt. *c.* 220–229 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4625 (BSA); Tipi forest rest house campus, alt. *c.* 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5242C (BSA).

Graphis ajarekarii Patw. & C.R. Kulk., Norweg. J. Bot. 26(1): 45. 1979.

Specimen examined: Arunachal Pradesh: West Kameng District, Tipi forest guest house campus, alt. *c.* 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5257 (BSA).

Graphis caesiella Vain., Acta Soc. Fauna Flora Fenn. 7 (2): 122. 1890.

Specimens examined: Arunachal Pradesh: Lower Subansiri District, fozali to fanhu road, alt. *c.* 1000 m, 22 Jan. 1984, *K.P. Singh* 5153B (ASSAM); West Kameng District, Dirang, Near Khopathar Bridge, alt. *c.* 1575 m, 06 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5068 (BSA); Tipi forest rest house campus, alt. *c.* 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5242A (BSA).

Graphis capillacea Stirt., Proc. Roy. Soc. Glasgow 11: 315. 1879.

Specimens examined: Arunachal Pradesh: East Kameng District, Phakui Wild life Sanctuary, Dichu-Julley Nala, alt. *c.* 300–440 m, 15 Apr. 1999, *K.P. Singh* 10035 (ASSAM); Upper Subansiri District, L.c. the way of Lebe to Nuk Basti, 25 Mar. 2000, *K.P. Singh* 10696B (ASSAM).

Graphis chlorotica A. Massal., in Kremp., Verh. K. K. Zool.-Bot. Ges. Wein. 21: 865. 1871.

Specimens examined: Arunachal Pradesh: Lower Debang Vally District, Roing-Anini Road, alt. *c.* 1350–1650 m, 12 Jan. 1984, *K.P. Singh* 4659 (ASSAM); Mehao Wild Life Sanctuary, Sally lake, alt. *c.* 500 m, 31 Oct. 2002, *P.K. Dixit* 278 E (BSA); Mehao Wild Life Sanctuary, Diti lake, alt. *c.* 2500–2750 m, 04 Nov. 2002, *K.P. Singh & P.K. Dixit* 365 (BSA); Mehao Wild Life Sanctuary, Sally lake, alt. *c.* 390–400 m, 07 Nov. 2002, *K.P. Singh & P.K. Dixit* 469B (BSA); West Kameng District, Shergaon forest, alt. *c.* 1950–2050 m, 24 Nov. 1984, *K.P. Singh* 5647 (ASSAM).

Graphis cincta (Pers.) Aptroot, in Archer, Fl. Australia 57: 651. 2009.

Specimens examined: Arunachal Pradesh: Changlang District, Namdapha, 43 mile, 22 Feb. 1982, *K.P. Singh* 823 (ASSAM); Upper Subansiri District, on the way of Dumporizo to Daporizo, 27 Mar. 2000, *K.P. Singh* 10689 & 10695 (ASSAM).

Graphis contortuplicata Müll. Arg., Linn. Soc., Bot. 29: 225. 1892.

Specimen examined: Arunachal Pradesh: Upper Subansiri District, Daporizo-Zero Road, 2 km from Daporizo, alt. *c.* 300 m, 16 Jan. 1983, *K.P. Singh* 4015 (ASSAM).

Graphis crebra Vain., Hedwigia 38: 256. 1899.

Specimen examined: Arunachal Pradesh: Upper Subansiri

District, on the way of Leb to Nuk basti, *K.P. Singh* 10696 D (ASSAM).

Graphis cycasicola A.W. Archer & Elix, Australas. Lichenol. 61: 18. 2007.

Specimen examined: Arunachal Pradesh: West Kameng District, Shergaon forest, alt. c. 1950–2050 m. 24 Nov. 1984, *K.P. Singh* 5683 (ASSAM).

Graphis daintreensis (A.W. Archer) A.W. Archer [as 'daintriensis'], *Telopea* 11 (1): 72. 2005.

Specimens examined: Arunachal Pradesh: West Kameng District, Bhalukpong, Kameng river bank, *K.P. Singh & G. Swarnalatha* 4640 & 4642 (BSA).

Graphis dimidiata Vain., Acta Soc. Fauna Flora Fenn. 7 (no. 2): 108. 1890.

Specimen examined: Arunachal Pradesh: West Kameng district, Dirang, Rama Camp, Chug forest, *K.P. Singh* 2011 (ASSAM).

Graphis duplicata Ach., Syn. Meth. Lich.: 81. 1814.

Specimens examined: Arunachal Pradesh: West Siang District, Nigam Basti towards Basar, alt. c. 680 m, 31 Dec. 1982, *K.P. Singh* 2537 (ASSAM); Lohit District, Namsai, Near Peyong village, alt. c. 180 m, 30 Dec. 1983, *K.P. Singh* 4172 (ASSAM); West Kameng District, Near Dedza bridge, Bhalukpong-Tanga road, alt. c. 1095 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4808B (BSA); Dirang, 2 km to Santhi Vally, alt. c. 1601 m, 06 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5049 (BSA).

Graphis farinulenta Müll. Arg., Bull. Soc. Roy. Bot. Belg. 30: 80. 1891.

Specimens examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Sally lake, alt. c. 500 m, 31 Oct. 2002, *P.K. Dixit* 282C, 282D & 282F (BSA).

Graphis filiformis Adaw. & Makhija, Mycotaxon 99: 314. 2007.

Specimens examined: Arunachal Pradesh: West Kameng District, Near Dedga bridge, Bhalukpong-Tanga Road, alt. c. 1216 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4872 & 4866 (BSA).

Graphis furcata Fée, Essai Crypt. Ecorc.: 40. 1824.

Specimens examined: Arunachal Pradesh: West Siang District, Along, Jamola Basti forest, along the riverside, alt. c. 400 m, 03 Jan. 1983, *K.P. Singh* 2612 (ASSAM); West Kameng District, Tipi-Bhalukpong Road, Dijiling forest, alt. c. 400 m, 18 Apr. 1982, *K.P. Singh* 1116B (ASSAM);

West Kameng district, 10.5 km to Nechiphu, Tanga-Bhalukpong Road, alt. c. 1184 m, 07 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5158 (BSA).

Graphis glaucescens Fée, Essai Crypt. Ecorc.: 36. 1824.

Specimen examined: Arunachal Pradesh: West Kameng District, Bhalukpong-Tipi Road, alt. c. 136 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4646 (BSA).

Graphis glauconigra Vain., Ann. Acad. Sci. Fenn., ser. A, 15(6): 242. 1921.

Specimen examined: Arunachal Pradesh: West Kameng District, Bhalukpong-Tipi road side forest, alt. c. 136 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4660 (BSA).

Graphis handelii Zahlbr., in Hand. -Mazz., Symb. Sin. 3: 39 & 40. 1930.

Specimens examined: Arunachal Pradesh: Mehao Wild Life Sanctuary, Mayudia, alt. c. 2250 m, 06 Nov. 2002, *K.P. Singh & P.K. Dixit* 442A (BSA).

Graphis intermediella Stirt., Proc. Roy. Soc. Glasgow 11: 316. 1879.

Specimen examined: Arunachal Pradesh: Changlang District, Miao, 15 Feb. 1982, *K.P. Singh* 659 (ASSAM).

Graphis japonica (Müll. Arg.) A.W. Archer & Lücking, in Lücking, Archer & Aptroot, Lichenologist 41 (4): 437. 2009.

Specimens examined: Arunachal Pradesh: Upper Subansiri District, Daporizo-Zero Road, 2 km from Daporizo, alt. c. 300 m, in *Terminalia* plantation, 16 Jan. 1983, *K.P. Singh* 3069 (ASSAM); West Kameng District, Sessa Orchid Sanctuary, alt. c. 1033–1170 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4716 (BSA); Tipi forest rest house campus, alt. c. 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5247 & 5251 (BSA).

Graphis kousyuensis (Horik. & M. Nakan.) Lücking, in Lücking, Archer & Aptroot, Lichenologist 41 (4): 437. 2009.

Specimens examined: Arunachal Pradesh: West Kameng District, on the fallen tree in Kameng River, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5313, 5294 (BSA).

Graphis librata C. Knight., Trans. New Zealand Inst. 16: 404. 1884.

Specimens examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Roing Mini Zoo Area, 09 Nov. 2002, *K.P. Singh & P. K. Dixit* 516 (BSA); West Kameng District, Tipi forest rest house campus, alt. c. 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5215, 5242B & 5253 (BSA).

Graphis longiramea Müll. Arg., J. Linn. Soc., Bot. 29: 225. 1892.

Specimens examined: Arunachal Pradesh: Tirap District, Khonsa, Khela forest, 27 Feb. 1982, *K.P. Singh* 967 (ASSAM); Lohit District, Madhuban Reserver forest, alt. c. 250 m, 30 Dec. 1983, *K.P. Singh* 4203 (ASSAM); Lower Dibang Vally, Roing, Deopani forest, along the stream, alt. c. 700 m, 04 June 1984, *D.K. Upreti* & *B.C. Upreti* L81756 (LWG); Mehao Wild Life Sanctuary, Diti hill, alt. c. 2550–2750 m, 04 Nov. 2002, *K.P. Singh* & *P.K. Dixit* 373F/2 (BSA); Mehao Lake, alt. c. 1550 m, 14 Nov. 2002, *K.P. Singh* & *P.K. Dixit* 547 & 559A (BSA); West Kameng District, Sessa Orchid Sanctuary, alt. c. 1033–1170 m, 01 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 4714 (BSA).

Graphis longispora D.D. Awasthi & S.R. Singh, Norweg. J. Bot. 24: 3. 1977.

Specimen examined: Arunachal Pradesh: Lower Debang Valley District, Riyali-Annini foot track, 10 km from Riyali, alt. c. 900 m, 13 Jan. 1984, *K.P. Singh* 4786 (ASSAM).

Graphis marginata Raddi., Raddi, G., Mem. Soc. Ital. Sc. 18: 344, tab. 3, fig. 2. 1820.

Specimen examined: Arunachal Pradesh: West Siang District, Along, Jamola Basti forest, along the riverside, alt. c. 400 m, 03 Jan. 1983, *K.P. Singh* 2611 (ASSAM).

Graphis nanodes Vain., Ann. Acad. Sci. Fenn. 15(6): 209. 1921.

Specimens examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, 9 Oct. 2001, *P.K. Dixit* 55 (BSA); West Kameng District, on fallen tree in Kameng river, 08 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 5305 (BSA).

Graphis parilis Kremp., Flora 59: 422 & 445. 1876.

Specimens examined: Arunachal Pradesh: East Kameng District, Phakui Wild life Sanctuary, Dichu-Julley Nala, alt. c. 300–440 m, 15 Apr. 1999, *K.P. Singh* 10084 (ASSAM); West Kameng District, 10.5 km to Nechiphu, Tanga-Bhalukpong Road, alt. c. 1184 m, 07 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 5151B & 5172 (BSA).

Graphis pertriosa (Kremp.) A.W. Archer, Telopea 11: 73. 2005.

Specimens examined: Arunachal Pradesh: West Kameng District, Dirang, Yang forest, alt. c. 1625–1800 m, 05 May. 1982, *K.P. Singh* 1897 (ASSAM); Dirang, near National Research Center on Yak, 04 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 4918A & 4918B (BSA); 10.5 km to Nechiphu,

Tanga-Bhalukpong Road, alt. c. 1184 m, 07 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 5151B & 5159 (BSA).

Graphis pinicola Zahlbr., in Hand.-Mazz., Symb. Sin. 3: 40 & 43. 1930.

Specimen examined: Arunachal Pradesh: West Kameng District, Tipi forest rest house campus, alt. c. 202 m, 08 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 5244 (BSA).

Graphis proserpens Vain., Bot. Tidsskr. 29(2): 132. 1909.

Specimens examined: Arunachal Pradesh: East Kameng District, Mehao Wild Life Sanctuary, Diti lake, alt. c. 2500–2750 m, 04 Nov. 2002, *K.P. Singh* & *P.K. Dixit* 370B, 376A & 390B (BSA); West Kameng District, 15 km to Sange, Dirang-Sange Road, alt. c. 2306–2344 m, 05 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 5003 (BSA).

Graphis pyrrhocheiloides Zahlbr., Cat. Lich. Univ. 2: 321. 1923.

Specimens examined: Arunachal Pradesh: Lohit District, Hayuliang Inspection Bungalow Compound, alt. c. 600 m, 04 Jan. 1984, *K.P. Singh* 4277A/B/C/D (ASSAM).

Graphis scripta (L.) Ach., Kgl. Vetensk. -Akad. Nya Handl.: 145. 1809.

Specimens examined: Arunachal Pradesh: East Kameng District, Phakui Wild Life Sanctuary, (Dichu-Julley Nala), alt. c. 300–440 m, 15 Apr. 1999, *K.P. Singh* 10023 (ASSAM); West Kameng District, Bomdila-Sepper Road, 2 km from Bomdila, alt. c. 2272–2300 m, 03 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 4816 (BSA).

Graphis sitapurensis Makhija & Adaw., Mycotaxon 91: 378. 2005.

Specimen examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Mahao Lake, alt. c. 1550 m, 14 Nov. 2002, *K.P. Singh* & *P.K. Dixit* 551A/2 (BSA).

Graphis streblocarpa (Bél.) Nyl., Flora 49: 133. 1866.

Specimens examined: Arunachal Pradesh: Changlang District, Namdapha, 36th mile, 20 Feb. 1982, *K.P. Singh* 796 (ASSAM); West Kameng District, Tipi, alt. c. 400 m, 16 Apr. 1982, *K.P. Singh* 1039 (ASSAM); Upper Subansiri District, Daporizo-Zero Road, 2 km from Daporizo, on *Terminalia* plantations, alt. c. 300, 16 Jan. 1983, *K.P. Singh* 3075 (ASSAM); Upper Subansiri District, Daporizo-Zero Road, 2 km from Daporizo, on *Terminalia* plantations, alt. c. 300, 15 Jan. 1983, *K.P. Singh* 3092 (ASSAM); Debang Vally District, Rayali-Kronli foot track, alt. c. 400–900 m, 14 Jan. 1984, *K.P. Singh* 4835 (ASSAM); Lower Subansiri

District, Yazali, Near Yazali bridge, alt. *c.* 750 m, 22 Jan. 1984, *K.P. Singh* 5105 (ASSAM); West Kameng District, Sessa Orchid Sanctuary, alt. 1150–1250 m, 9 Oct. 2001, *P.K. Dixit* 09 (BSA).

Graphis striatula (Ach.) Spreng., Syst. Veg. Lich. 4: 250. 1827.

Specimens examined: Arunachal Pradesh: East Kameng District, Seppa, Kuchinalakaku kau, alt. *c.* 550–1050 m, 11 May 1982, *K.P. Singh* 2103 (ASSAM); West Kameng District, Near Dedga bridge, 15 km to tanga, Bhalukpong-Bomdila Road, alt. *c.* 1094 m, 03 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4787 (BSA).

Graphis subassimilis Müll. Arg., Flora 65: 333. 1882.

Specimen examined: Arunachal Pradesh: Upper Subansiri District, Daporizo-Leko basti post, alt. *c.* 300–500, 14 Jan. 1983, *K.P. Singh* 3002 (ASSAM).

Graphis subserpentina Nyl., Acta Soc. Sci. Fenn. 7: 465. 1863.

Specimens examined: Arunachal Pradesh: West Kameng District, Dirang, Yang forest, alt. *c.* 1625–1800 m, 05 May 1982, *K.P. Singh* 1900A (ASSAM); Dirang, Near Apple garden, alt. *c.* 2123 m, 06 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5130 (BSA).

Graphis tenella Ach., Syn. Meth. Lich.: 81. 1814.

Specimen examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Mahao lake, alt. *c.* 1550–1700 m, 15 Nov. 2002, *K.P. Singh & P.K. Dixit* 608A (BSA).

Graphis cf. valparaiensis Adaw. & Makhija, Mycotaxon 99: 323. 2007.

Specimens examined: Arunachal Pradesh: Changalang District, Namdapha, 21 Mar. 1981, *K. P. Singh* 310 (ASSAM); Debang Valley, Rayali-Kronli foot track, alt. *c.* 400"900 m, 14 Jan. 1984, *K.P. Singh* 4826 (ASSAM); Mehao Wild Life Sanctuary, Diti lake, alt. *c.* 2500-2750 m, 04 Nov. 2002, *K.P. Singh & P.K. Dixit* 379 (BSA); Lower Dibang Valley District, Mehao Wild Life Sanctuary, Diti hill, alt. *c.* 2500-2750 m, 04 Nov. 2002, *K.P. Singh & P.K. Dixit* 383B (BSA); Mehao Wild Life Sanctuary, Mehao lake, alt. *c.* 1550 m, 14 Nov. 2002, *K.P. Singh & P.K. Dixit* 548D, 562B & 565D (BSA); Mehao lake, alt. *c.* 1550–1700 m, 15 Nov. 2002, *K.P. Singh & P.K. Dixit* 548D & 565D (BSA); Mehao lake, alt. *c.* 1550-1700 m, 15 Nov. 2002, *K.P. Singh & P.K. Dixit* 607E (BSA); Mehao Wild Life Sanctuary, Baudhi camp to Mehao lake, alt. *c.* 1400-1500 m, 16 Nov. 2002, *K.P. Singh & P.K. Dixit* 636A (BSA); Mahao lake to

Devpani track, 17 Nov. 2002, *K.P. Singh & P.K. Dixit* 648D (BSA); West Kameng District, Tipi forest rest house campus, alt. *c.* 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5180, 5250 & 5255 (BSA).

Graphis vittata Müll. Arg., Flora 65: 335. 1882.

Specimens examined: Arunachal Pradesh: Changlang District, Namdapha, *K.P. Singh* 331 (ASSAM); West Kameng District, Tipi-Bhalukpong Road, Dijiling forest, alt. *c.* 400 m, 18 Apr. 1982, *K.P. Singh* 1116A/C/D, 1122, 1133 & 1143 (ASSAM); Lower Dibang Valley District, Mehao Wild Life Sanctuary, Mahao lake, alt. *c.* 1550–1700 m, 15 Nov. 2002, *K.P. Singh & P.K. Dixit* 603A (BSA).

Hemithecium amboliense Makhija & Dube, in Makhija, Dube, Adawadkar & Chitale, Mycotaxon 93: 367. 2005.

Specimen examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Roing Mini Zoo, 09 Nov. 2002, *K.P. Singh & P.K. Dixit* 504F (BSA).

Hemithecium aphanomicrosporium Makhija & Adaw., Mycotaxon 91: 348. 2005.

Specimen examined: Arunachal Pradesh: West Kameng District, Tipi, Neychning festival ground, near during bridge, alt. *c.* 160 m, 02 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4757 (BSA).

Hemithecium aphanes (Mont. & Bosch) M. Nakan. & Kashiw., Bull. Natl. Sci. Mus. Tokyo, B, 29(2): 88. 2003.

Specimens examined: Arunachal Pradesh: Debang Valley, Hunli-Desali foot track, alt. *c.* 400–900 m, 15 Jan. 1984, *K.P. Singh* 4901 (ASSAM); East Kameng District, Phakui Wild Life Sanctuary, (Dichu–Jully Nala), alt. *c.* 300–440 m, 15 Apr. 1999, *K.P. Singh* 10023 (ASSAM); Lower Dibang Valley District, Mehao Wild Life Sanctuary, Mehao lake to Mini Mehao lake, 23 Nov. 2000, *K.P. Singh & P. Bujarbarua* 11141 (ASSAM); 10 Oct. 2001, *P.K. Dixit* 56 & 57 (BSA); West Kameng District, Bhalukpong, Kameng river bank, alt. *c.* 220–229 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4635 (BSA); Bhalukpong–Tipi Road, alt. *c.* 136 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4649, 4670, 4671 (BSA); Sessa Orchid Sanctuary, alt. *c.* 1033–1170 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4719 (BSA); Tipi forest rest house campus, alt. *c.* 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5189, 5190 (BSA); Bhalukpong–Tipi Road, alt. *c.* 136 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5322B (BSA).

Hemithecium balaghatensis Adaw. & Makhija, Mycotaxon 92: 388. 2005.

Specimen examined: Arunachal Pradesh: West Kameng

District, Tipi forest rest house campus, alt. *c.* 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5203 (BSA).

Hemithecium nagalandicum (Kr.P. Singh & G.P. Sinha) Adaw. & Makhija, Mycotaxon 92: 390. 2005

Specimens examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Mehao lake to Gahori Camp, 25 Nov. 2000, *K.P. Singh & P. Bujarbarua* 11225 (ASSAM); 09 Oct. 2001, *P.K. Dixit* 30 (BSA); Mehao Lake, alt. *c.* 1550 m, 14 Nov. 2002, *K.P. Singh & P.K. Dixit* 554E & 556B (BSA); Mehao Wild Life Sanctuary, Baudhi Camp to Mehao Lake, alt. *c.* 1400–1550 m, 16 Nov. 2002, *K.P. Singh & P.K. Dixit* 628A (BSA).

Hemithecium nakanishianum (Patw. & C.R. Kulk.) Makhija & Dube, in Makhija, Dube, Adawadkar & Chitale, Mycotaxon 93: 370. 2005.

Specimen examined: Arunachal Pradesh: West Kameng, Bhalukpong–Tipi Road, alt. *c.* 136 m, 01 Mar. 2009, *K.P. Singh & G. Swarnalatha* 4652 (BSA).

Hemithecium norsticticum Makhija & Dube, in Makhija, Dube, Adawadkar & Chitale, Mycotaxon 93: 371. 2005.

Specimen examined: Arunachal Pradesh: West Kameng District, Tipi–Bhalukpong road side forest; alt. *c.* 250–300 m, 10 Oct. 2001, *G.P. Sinha & T.A.M. Jagadeesh* 11292 (ASSAM).

Leiorreuma exaltatum (Mont. & Bosch) Staiger, Biblioth. Lichenol. 85: 298. 2002.

Specimen examined: Arunachal Pradesh: Debang Valley, Rayali–Kronli foot track, alt. *c.* 400–900 m, 14 Jan. 1984, *K.P. Singh* 4886 (ASSAM).

Leiorreuma lyellii (Sm.) Staiger, Biblioth. Lichenol. 85: 301. 2002.

Specimen examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Sally lake, alt. *c.* 500 m, 12 Nov. 2000, *K.P. Singh & P. Bujarbarua* 10870 (BSA).

Leiorreuma subpatellulum Dubey, Upreti & Nayaka, Lichenologist 42 (6): 711. 2010.

Specimen examined: Arunachal Pradesh: Upper Siang District, Jengging, near circuit house, 28°54' N 95°06' E, alt. 900 m, on bark, 30 Oct. 2007, *U. Dubey* 07-011897 (holotype-LWG!).

Pallidogramme chrysenteron (Mont.) Staiger, Kalb & Lücking, in Lücking, Chaves, Sipman, Umaña & Aptroot, Fieldiana, Bot. 46: 9. 2008.

Specimen examined: Arunachal Pradesh: Lower Subansiri

District, on the way of Tazang, 2 km from Ziro, 25 Sep. 1981, *K.P. Singh* 620 (ASSAM).

Phaeographis caesioradians (Leight.) A.W. Archer, Telopea 11: 75. 2005.

Specimen examined: Arunachal Pradesh: Upper Subansiri District, Daporizo, alt. *c.* 300–600 m, 15 Jan. 1983, *K.P. Singh* 4053 (ASSAM).

Phaeographis dendroides (Leight.) Müll. Arg., Flora, 65: 336. 1882b.

Specimen examined: Arunachal Pradesh: West Siang District, Doji, 16 km from Along towards Basar, 26 Mar. 2006, *U. Dubey* 06-006342 (LWG)

Phaeographis divaricoides Räsänen, in Arch. Soc. Zool. Bot. Fenn. Vanamo 5: 31. 1950.

Specimens examined: Arunachal Pradesh: Mehao Wild Life Sanctuary, Mehao to Ghauri Camp, alt. *c.* 1500–1550 m, 16 Nov. 2002, *K.P. Singh & P.K. Dixit* 615B (BSA); Mehao Wild Life Sanctuary, Baudhi to Mehao lake, alt. *c.* 1400–1550 m, 16 Nov. 2002, *K.P. Singh & P.K. Dixit* 636C (BSA).

Phaeographis intricans (Nyl.) Staiger, Biblioth. Lichenol. 85: 329. 2002.

Specimen examined: Arunachal Pradesh: Lower Dibang Valley District, Mehao Wild Life Sanctuary, Mehao Lake, alt. *c.* 1550–1700 m., 15 Nov. 2002, *K.P. Singh & P.K. Dixit* 581D (BSA).

Phaeographis sculpturata (Ach.) Staiger, Biblioth. Lichenol. 85: 345. 2002.

Specimen examined: Arunachal Pradesh: Changlang District, Namdapha, 21 Mar. 1981, *K.P. Singh* 308 (ASSAM).

Phaeographopsis indica (Patw. & Nagarkar) Sipman & Aptroot, in Aptroot, Diederich, Sérusieux & Sipman, Biblioth. Lichenol. 64: 129. 1997

Specimen examined: Arunachal Pradesh: West Kameng District, Tipi forest rest house campus, alt. *c.* 202 m, 08 Mar. 2009, *K.P. Singh & G. Swarnalatha* 5182 (BSA).

Platygramme caesiopruinosa (Fée) Fée, Bull. Soc. Bot. France 21: 30. 1874.

Specimen examined: Arunachal Pradesh: West Kameng District, Dirang, Yarg forest, alt. *c.* 1625–1800 m, 05 May 1982, *K.P. Singh* 1900B (ASSAM).

Platygramme discurrens (Nyl.) Staiger, Biblioth. Lichenol. 85: 362. 2002.

Specimens examined: Arunachal Pradesh: West Siang District, Bame to Daborijo Road, Near RMP camp, alt. *c.*

900 m, 30 Dec. 1982, *K.P. Singh* 2481C (ASSAM); Lower Subansiri District, on the way of Piti from Yazali, up to 300 km, 21 Mar. 2000, *K.P. Singh* 10451 (ASSAM).

Platygramme wattiana (Müll. Arg.) V. Tewari & Upreti, Indian J. Forest. 31(3): 458. 2008.

Specimens examined: Arunachal Pradesh: Near Lailyngkot, 19 Jan. 1981, *K.P. Singh* 145 (ASSAM); Lower Subansiri District, Ganga nagar, 22 Sep. 1981, *K.P. Singh* 344 (ASSAM); West Siang District, Bame to Daborijo Road, 30 Dec. 1982, *K.P. Singh* 2481 (ASSAM).

Sarcographa glyphiza (Nyl.) Kr.P. Singh & G.P. Sinha, Indian Lichens: An Annotated Checklist, 13. 2010.

Specimens examined: Arunachal Pradesh: East Kameng District, Seppa, Kuchchinalakaku kau, alt. *c.* 550–1050 m, 11 May 1982, *K.P. Singh* 2111 (ASSAM); Basar Nigam, alt. *c.* 680 m, 31 Dec. 1982, *K.P. Singh* 2545C (ASSAM); Upper Subansiri District, Daporizo-Zero Road 2 km from Daporizo, on *Terminalia* tree, 16 Jan. 1983, *K.P. Singh* 3068 (ASSAM); Upper Subansiri District, Daporizo, Donbasti forest, alt. *c.* 300–600 m, 17 Jan. 1983, *K.P. Singh* 4045A (ASSAM); East Kameng District, Phakui Wild Life Sanctuary, Dichu–Julley Nala, alt. *c.* 300–440 m, 15 Apr. 1999, *K.P. Singh* 10090 (ASSAM).

Sarcographa labyrinthica (Ach.) Müll. Arg., Mem. Soc. Phys. Genève 29(8): 62. 1887.

Specimens examined: Arunachal Pradesh: Changlang District, 36th mile Nandapha, 20 Feb. 1982, *K.P. Singh* 761 (ASSAM); Tirap District, Khonsa, Khela forest, 27 Feb. 1982, *K.P. Singh* 977, 1001 (ASSAM); Lohit District, Madhuban Reserver forest, alt. *c.* 250 m, 30 Dec. 1983, *K.P. Singh* 4203 (ASSAM); Upper Subansiri District, Daporizo, zero Road 2 km from Daprizo, alt. *c.* 300 m, 16 Jan. 1983, *K.P. Singh* 4003 (ASSAM); Daporizo, Donbasti forest, alt. *c.* 300–600 m, 17 Jan. 1983, *K.P. Singh* 4045B/C (ASSAM); Lower Dibang Valley District, Mehao Wild Life Sanctuary, Mahao Lake north bank, 24 Nov. 2000, *K.P. Singh* & *P. Bujarbarua* 11181 (ASSAM); West Kameng District, Tipi, Near Neychiung festival ground, alt. *c.* 160 m, 02 Mar. 2009, *K.P. Singh* & *G. Swarnalatha* 4748 (BSA).

Sarcographa medusulina (Nyl.) Müll. Arg., Flora, Regensburg 70: 77. 1887c.

Specimen examined: Arunachal Pradesh: West Siang District, Basar Nigam, alt. *c.* 680 m, 31 Dec. 1982, *K.P. Singh* 2545A (ASSAM).

Sarcographa tricosia (Ach.) Müll. Arg., Mém. Soc. Phys. Genève 29 (8): 63. 1887c.

Specimens examined: Arunachal Pradesh: Tirap District, Khonsa, Khela forest, 27 Feb. 1982, *K.P. Singh* 969 (ASSAM); West Siang District, Basar Nigam, alt. *c.* 680 m, 31 Dec. 1982, *K.P. Singh* 2545B (ASSAM); Debang Valley, Rayali-Anniri foot track, alt. *c.* 900 m, 13 Jan. 1984, *K.P. Singh* 4752 (ASSAM); Debang Vally, Rayali-Krouls foot track, alt. *c.* 400–900 m, 14 Jan. 1984, *K.P. Singh* 4848 (ASSAM); Debang Vally, Hunh-Desali foot track, alt. *c.* 400–900 m, 15 Jan. 1984, *K.P. Singh* 4945 (ASSAM); Debang Vally, Hunh-Desali foot track, alt. *c.* 400–900 m, 15 Jan. 1984, *K.P. Singh* 4945 (ASSAM); Lower Debang Valley District, Roing-Anini Road, foot track, 16 Jan. 1984, *K.P. Singh* 5019C (ASSAM); Mehao Wild Life Sanctuary, Mehao Lake, alt. *c.* 1550 m, 14 Nov. 2002, *K.P. Singh* & *P.K. Dixit* 547 & 559A (BSA); Lower Subansiri District, Near Kimin, alt. *c.* 400 m, 21 Jan. 1984, *K.P. Singh* 5073 (ASSAM).

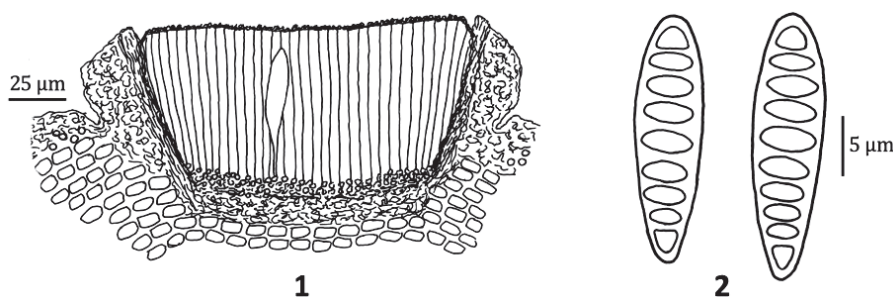
Schistophoron indicum Kr. P. Singh & Swarnal. Lichenologist 43(3): 209. 2011.

Specimens examined: Arunachal Pradesh: East Siang District, Gette Basti, alt. *c.* 500–700 m, 8 Jan. 1983, *K.P. Singh* 2858 (holotypus - BSA!; isotypus - ASSAM!).

Thallolema hypoleptum (Nyl.) Staiger, Biblioth. Lichenol. 85: 437. 2002.

Graphis hypolepta Nyl., Acta. Soc. Sci. Fenn. 7: 472. 1863a. - Type: Colombia (Nova Granata), Bogot, 2400 m, Leg. Lindig nr. 715. (isotype - M).

Thallus corticolous, epiphloeodal, 42–48 µm thick above the bark, 5–8.4 cm diam., continuous, delimited by blackish-brown prothallus; surface yellowish white, farinose. Thallus in section lacking upper cortex and has numerous calcium-



Figs. 1-2. *Thallolema hypoleptum*(Nyl.) Staiger : 1. V.S. of ascomata, 2. Ascospores.

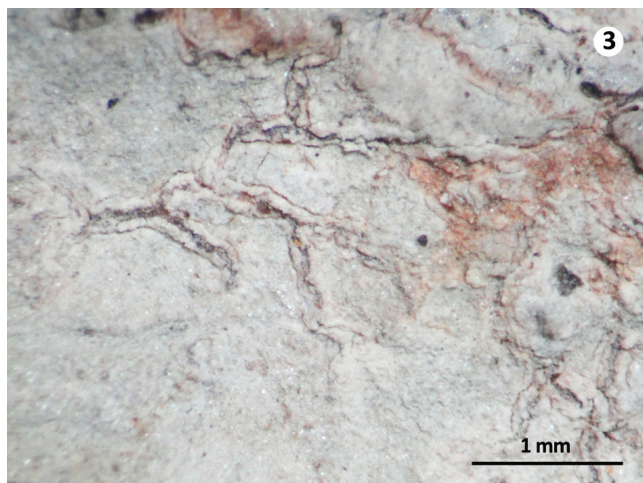


Fig. 3. *Thalloloma hypoleptum* (Nyl.) Staiger

oxalate crystals. Ascomata lirelliform, concolorous with thallus, delicate, simple to bifurcate or irregularly branched, straight to curved, immersed to erumpent, with lateral thalline margin, 0.8–2.5 mm long and less than 0.1–0.2 mm broad, acute at the ends, thalline margin separated from thallus by a slit; disc slit-like to moderately open, slightly concave, reddish brown, with white pruina; excipulum complete, uncarbonized, golden-brown, laterally covered by thalline margin; labia entire, divergent; epihymenium brown to dark-brown, 6–8 μm high; hymenium hyaline, not inspersed, 58–73 μm high, I–; subhymenium hyaline, 16–21 μm high; paraphyses unbranched to branched and anastomosing, c. 1.5 μm thick, tips branched, brown walled. Asci ellipsoid, 43–52 \times 14.5–17.5 μm . Ascospores 8 per ascus, biseriate to aggregate, ellipsoid, transversely septate, 18–26 \times 6–8 μm , 5–9 locular, hyaline, I+ blue-violet.

Chemistry: Thallus K–, C–, KC–, P–; UV+ yellow; lichexanthone present.

Remarks: *Thalloloma hypoleptum* is characterised by its yellowish white, farinose, ecorticate thallus; immersed to erumpent, lirelliform ascomata; moderately open, reddish-brown disc with white pruina; uncarbonized excipulum with entire, divergent labia; hyaline, transversely septate, 18–26 μm long ascospores and presence of lichexanthone (thallus UV+ yellow). *T. hypoleptum* somewhat resembles *T. anguinaeforme* in external morphology but latter species differs by having muriform ascospores and lacking lichexanthone (thallus UV–). Further, *T. deplanatum* is another morphologically similar species but *T. deplanatum* distinguished by its larger (50–65 \times 10–13 μm and 10–15 locular) ascospores.

Distribution: Borneo, Japan, Papua New Guinea, North and South America; it is now reported here from India

Specimen examined: Arunachal Pradesh: West Kameng

District, Sessa Orchid Sanctuary, alt. 1033–1170 m, 01 Mar. 2009, K.P. Singh & G. Swarnalatha 4717 (BSA).

Remarks: In the study area the species has been collected from tree barks in evergreen subtropical forests of West Kameng District. This is phyto-geographically interesting as the only other species of the genus recorded in India is *Thalloloma patulum* (A. W. Archer) Adaw. & Makhija.

Thecaria quassiicola Fée as '*quassiaecola*', Meth. Lichenogr. Gen.: 92, tab. 1, fig. 16. 1824.

Specimens examined: Arunachal Pradesh: Tirap District, Khonsa, Khela forest, 27 Feb. 1982, K.P. Singh 939 (ASSAM); West Kameng District, Tipi–Bhalukpong Road, Desiling forest, 18 Apr. 1982, K.P. Singh 1141 (ASSAM); West Siang District, Along, Jamola Basti forest, along the riverside, alt. c. 400 m, 03 Jan. 1983, K.P. Singh 2605 (ASSAM); Upper Subansiri District, Daporizo to Leko basti forest, alt. c. 300–500 m, 14 Jan. 1983, K.P. Singh 2979 (ASSAM); Lower Dibang Valley District, Roing Anini Road, 16 Jan. 1984, K.P. Singh 5026 (ASSAM); Roing, Near Damduck bifurcation, alt. c. 450 m, 17 Jan. 1984, K.P. Singh 5034 (ASSAM).

Acknowledgements

The author is thankful to present and former Director, Botanical Survey of India, Kolkata, and to former Heads of Office, Botanical Survey of India, Central Regional Centre, Allahabad, for providing facilities during the study. Thanks are also due to the authorities of ASSAM and LWG for loan of specimens. The author is grateful also to Ministry of Environment, Forests and Climate Change, New Delhi, for financial assistance under AICOPTAX - Lichens & Bryophytes project during December 2007 to March 2012.

References

- Lücking, R. and Rivas Plata, E. (2008). Clave y guýailustrada para géneros de *Graphidaceae*. *Glia* 1: 1–41.
- Singh, K. P. and Swarnalatha, G. (2011). A new species of *Schistophoron* from India. *Lichenologist* 43 (3): 209–212.
- Singh, K. P. and Swarnalatha, G. (2011). A note on Graphidaceous lichens from Arunachal Pradesh, India. *Indian J. For.* 34 (3): 353–360.
- Singh, K. P., Swarnalatha, G. and Singh, S. B. (2011). New records to genus *Graphis* (Lichenized Fungi) from India. *Indian J. For.* 34 (2): 243–244.
- Staiger, B. (2002). Die Flechnfamilie *Graphidaceae*: Studien in Richtung einer natürlischeren Gliederung. *Biblioth. Lichenol.* 85: 1–526.
- White, F. J. and James, P. W. (1985). A new guide to microchemical techniques for the identification of lichen substances. *British Lichen Society Bulletin* 57 (Supplement): 1–41.