(VII)

ADDITIONS TO THE PARMELIOID LICHEN FLORA OF INDIA

India has a rich diversity of Parmelioid lichens. Divakar and Upreti (2005a) reported the occurrence of 192 species of *Parmelia* s. lat. in 22 genera. Divakar and Upreti (2005b) subsequently added further eight species [*Melanelixia glabroides* (Essl.) O. Blanco *et al*., *Melanohalea nilgirica* Divakar and Upreti, *M. poeltii* (Essl.) O. Blanco *et al*., *M. septentrionalis* (Lynge) O. Blanco *et al*., *Parmelia isidioclada* Vain., *P. masonii* Essl. and Poelt, *Parmelinopsis afrorevoluta* (Krog and Swinscow) Elix and Hale, and *Parmeliopsis ambigua* (Wulfen) Nyl.] to the Indian lichen flora. Some of the species reported previously from India (Divakar and Upreti, 2002, 2003, 2005a) have been re-examined using HPLC to confirm the identity of secondary metabolites (Feige *et al*., 1993) in the present communication. This has resulted in a further two additions to the Parmelioid lichen flora of India.

Canoparmelia owariensis (Asah.) Elix, Mycotaxon 47: 127. 1993. *Parmelia owariensis* Asah., Jour. Jap. Bot. 28(5): 135. 1953.

Lectotype : Inuyama, Province Owari, Japan, *Asahina* (TNS).

Thallus saxicolous (Fig. 1), closely adnate, 4.0–8.0 cm wide. Lobes sublinear, 0.5–2.0 mm wide. Upper surface yellowish or whitish mineral grey, plane, shiny, emaculate, darker and cracked in older parts, isidiate-pustulate; isidia coarse, short, stout, cylindrical to irregularly inflated, bursting open apically but not forming soredia. Lower surface black, with a narrow brown, erhizinate, marginal zone, sparsely rhizinate. Medulla white. Apothecia and pycnidia not seen.

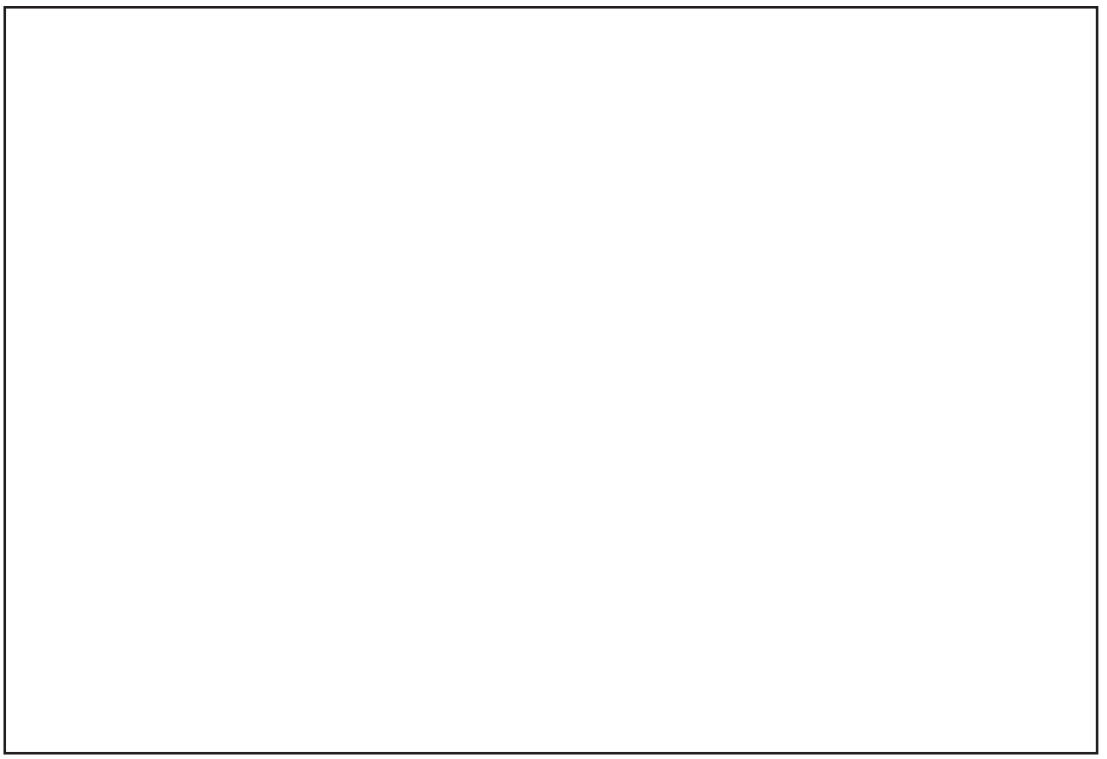
Chemistry : Cortex K+ yellow; medulla K– or + pale yellow, C–, KC+ pink or faint red, P–. HPLC: atranorin (minor), chloroatranorin (minor), divaricatic acid (major), gyrophoric acid (minor), lecanoric acid (minor), subdivaricatic acid (minor).

Specimen examined: India – Tamil Nadu, Madurai District, Highways (Meghamalai), Check post, 1700 m, on rock, 24-03-1999, *S. Nayaka* 307/B (LWG).

Remarks : In overall morphology *C. owariensis* is close to *C. eruptens* (Kurok.) Elix and Hale, and *C. pustulescens* (Kurok.) Elix, two other Indian *Canoparmelia* species having an isidiate-pustulate upper surface. *C. owariensis* can readily be distinguished from *C. eruptens* by the narrower lobes (0.5-2.0 mm wide cf. 2-8 mm wide), saxicolous habit and the presence of divaricatic acid (major) and gyrophoric, lecanoric, subdivaricatic acids as minor chemical substances. *Canoparmelia eruptens* is typically corticolous and only contains atranorin and divaricatic acid. *Canoparmelia pustulescens* is a saxicolous species but differs in producing sekikaic acid as the major secondary metabolite.

This specimen was previously

Fig. 1



Habit of *Canoparmelia owariensis* (Asah.) Elix and isidiate-pustules (inset).

annotated as *Parmotrema stuhlmannii* (Dodge) Krog and Swinscow because of the erhizinate marginal zone (Divakar and Upreti 2003, 2005a), but the narrow lobes and chemistry now distinguish it as *C. owariensis*. Since the report of *P. stuhlmanii* in India was based on this single specimen, this species should be excluded from Indian lichen flora.

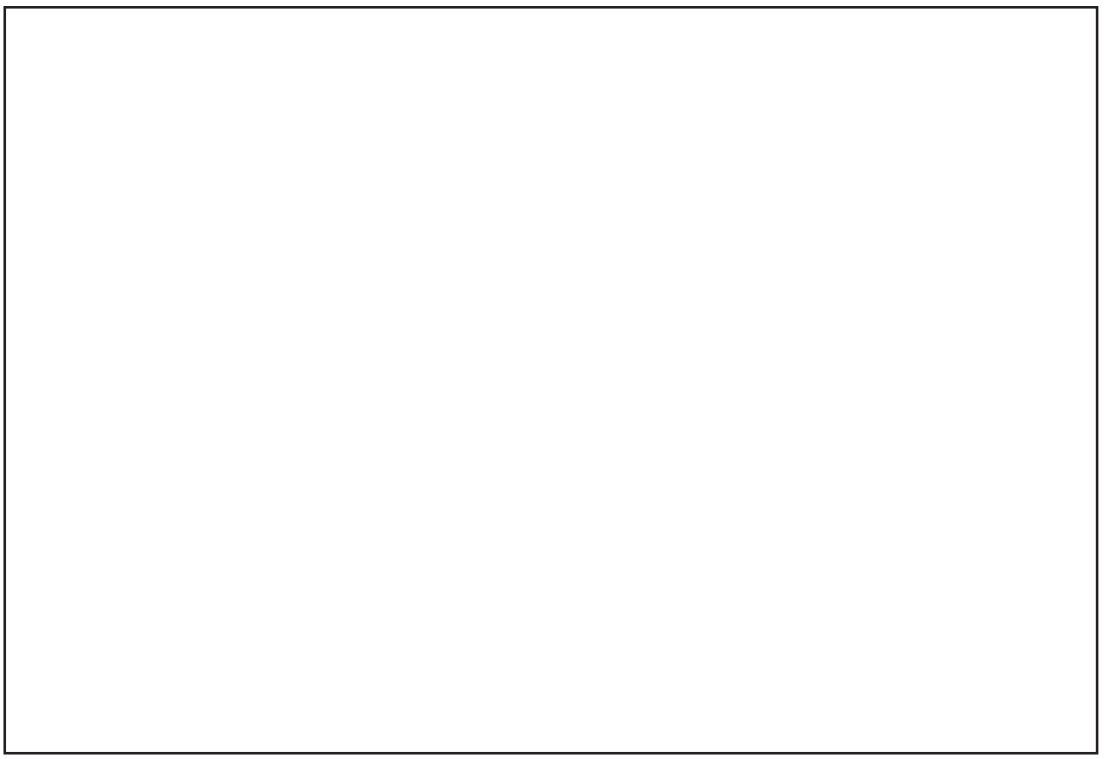
Distribution: *C. owariensis* is a paleotropical species known from Africa, China, Japan, Thailand and Australia (Elix, 2001). In India it was collected in the Meghamalai Wildlife Sanctuary, a part of Western Ghats, at an altitude of 1,700 m.

Xanthoparmelia subramigera (Gyelnik) Hale, Phytologia 28: 489. 1974. *Parmelia subramigera* Gyelnik, Fedde Repertorium Specierum Novarum Regni Vegetabilis 29: 281. 1931.

Lectotype : Rainbow Fall, Hawaii, USA, *Faurie* 856 (BP).

Thallus saxicolous (Fig. 2), adnate to loosely adnate, 3.0–5.0 cm across. Lobes rotund to sublinear, shining, 0.3-1.75 mm wide. Upper surface dull yellowish green, plane, emaculate, isidiate. Isidia globose to cylindrical, usually simple and plain throughout, occasionally black tipped, distributed throughout the upper surface

Fig. 2



Habit of *Xanthoparmelia subramigera* (Gyelnik) Hale

but dense at the centre. Lower surface brown to dark brown, rhizines frequent. Medulla white. Apothecia and pycnidia not seen.

Chemistry : Cortex K+ yellow; medulla K+ yellow, C–, KC–, P+ bright orange-red. HPLC: usnic acid (minor), succinprotocetraric acid (major), fumarprotocetraric acid (major), protocetraric acid (trace).

Specimen examined : Tamil Nadu – Palni Hills, Perumalmalai area, near Perumal Peak, 1800 – 2350 m, on rocks, 17-12-1970, *K.P. Singh* 70-1103 (LWG-LWU).

Remarks : Because of having similar morphology and P+ orange-red medulla *X. subramigera* can easily be confused with *X. fucina* Knox. Both the species differs in chemistry as *X. subramigera* contains succinoprotocetraric and fumarprotocetraric acid whereas *X. fucina* contains protocetraric acid as a major secondary metabolite. Previously this specimen was identified as *X. fucina* (Divakar and Upreti, 2002, 2005a).

Distribution : *X. subramigera* is a widespread subtropical species known from Central and South America, South Africa, South-East Asia, islands in the Pacific Ocean (Louwhoff and Elix, 2000) and Laurimacaronesian Archipeligo (Elix and Schumm, 2003). In India it was collected

from the Palni Hills in the Western Ghats between altitudes of 1800–2350 m.

Excluded species

The following species previously reported from India, are now excluded from Indian lichen flora. The specimens earlier annotated as *X. bellatula* (Kurok. and Filson) Elix and Johnst. and *X. terricloa* Hale, Nash and Elix (Divakar and Upreti 2002, 2005a) have now been identified as *X. stenophylla* (Ach.) Ahti and D. Hawksw.

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