The Fruticose Lichens in the Forest Tahura (Taman Hutan Raya) R. Soeryo, East Java

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ABSTRACT

A taxonomic study of the fruticose lichens in the forest of Tahura (Taman Hutan Raya) R. Soeryo had been conducted based on morphological, anatomical and chemical characters. In this research involved a method of descriptive explorative and the aim of this research is to identify and determine of fruticose lichens in the forest of Tahura R. Soeryo. Eleven species of fruticose lichen are reported for the first time from the forest of Tahura R. Soeryo. They are *Evernia prunastri*, *Ramalina calicaris*, *Teloschistes flavicans*, *Usnea glabrescens*, *U. subfloridana*, *U. Ceratina*, *U. floridana*, *U. hirta* and three species were found as new records in Java are *U. esperantiana*, *U. flammea*, and *U. strigosa*. Taxonomic descriptions and figures are presented in the article.

Key word: Lichen, new records, R. Soeryo, taxonomy

Lichen Tipe Fruticose di Tahura (Taman Hutan Raya) R. Soeryo, Jawa Timur

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ABSTRAK

Penelitian taksonomi lichen tipe fruticose di hutan Tahura (Taman Hutan Raya) R. Soeryo berdasarkan karakter morfologi, anatomi, dan uji kimia. Penelitian ini merupakan deskriptif eksploratif yang bertujuan untuk mengidentifikasi dan menentukan setiap spesies lichen tipe fruticose hutan Tahura R. Soeryo. Telah dilaporkan pertama kali sebelas spesies lichen tipe fruticose dari hutan Tahura R. Soeryo, yaitu *Evernia prunastri*, *Ramalina calicaris*, *Teloschistes flavicans*, *Usnea glabrescens*, *U. subfloridana*, *U. Ceratina*, *U. floridana*, *U. hirta* dan tiga spesies ditemukan sebagai catatan baru di Jawa yaitu *U. esperantiana*, *U. flammea*, dan *U. strigosa*. Deskripsi taksonomis dan gambar disajikan dalam artikel ini.

Kata Kunci: Catatan baru, lichen, R. Soeryo, taksonomi

INTRODUCTION

The diversity data of crustose [1] and foliose [2,3] lichen was previously reported, but fruticose lichen from Tahura R. Soeryo has never been reported. Lichens have a big diversity in this forest, however, people pay very small attention in this subject, which is still neglected. Lichens are a very potential ecosystem. Lichens have been identified as valuable indicators of environmental quality

[4]. This rich diversity of lichen indicates good forest health.

Lichens can also be very useful as medicine, antibiotic, antimutagenic, cosmetic [5,6] and pesticide [7]. Deforestation is a major environmental issue which may cause disappearance of many lichen species without being studied. Lichen species information is very important to utilization. Therefore, we had conducted a lichen taxonomical research in purpose to identify of

fruticose lichens in Tahura R. Soeryo. By studying and knowing lichens species in Tahura we hope students, college students, and society, to know diversity species of lichens conserve it.

METHODS

This research is descriptive explorative was conducted from December- January 2016, and using the descriptive explorative method. The identification based on character of determining the of the thallus are colour, shape, type, branched, medulla; the presence or absence of apothecia, soredia, soralia, isidia, fibril, papillae, the color and type of rhizine and chemical tested. The chemical color tests used are P (Phenylenediamin), K (Potassium hydroxide), and C (Calcium hypochlorite). The identification of mycocrystals used various reagents i.e. GAW (H_2O :glycerol:ethanol = 1:1:1), GE (acetic acid:glycerol = 1:3), An (aniline:glycerol:ethanol = 1:2:2), dan oT (o-toluidine:glycerol:ethanol = 1:2:2).

RESULTS AND DISCUSSION

The fruticose lichen in the forest of Tahura R. Soeryo, Batu, East Java consist of three families and 11 species. In this research the Family Parmeliaceae is the most common with nine species being identified. Detailed features comprising of species is provided below.

***Teloschistes flavicans* (Sw.) Norm.** This lichen belongs to Teloschistaceae family. Thallus is caespitose or prostrate, orange yellowish up to 4 cm long with highly branched, rather flattened, solid, claw shaped, irregular branched, with grey soredia scattered, rhizine absent and without apothecia (Figure 1). The chemical test in medulla are C -, K + red, P + red.

Figure 1. *Teloschistes flavicans*, A. Morphology of thallus, B. Solid & Caespitose. Scales: 0.5 mm

***Ramalina calicaris* (L.) Fr. Fries, Sched, Critic.** This lichen belongs to Ramalinaceae family. Thallus cartilaginous, green up to 3 mm broad, long with narrow

divided branches, flattened, yellowish light brown apothecia, one septate spora and irregular branched (Figure 2). Chemical test in medulla are C -, K -, P -.

Figure 2. *Ramalina calicaris*, A. Morphology of thallus, B. Apothecia. Scales: 0.5 mm

***Evernia prunastri*.** This lichen belongs to Parmeliaceae family. Thallus greyish green, flattened, rhizine black simple and toward the thallus, dichotomous branches, with soredia grayish green and isidia, without apothecia (Figure 3). Chemical test in medulla are C -, K -, P + red.

Figure 3. *Evernia prunastri*, A. Morphology of thallus, B. Rhizine (black line) & Soredia (red line). Scales: 0.5 mm

***Usnea esperantiana* P. Clerc.** This lichen belongs to Parmeliaceae family. Thallus shrubby, grey green, with green soredia, tufted, base pale to light brownish, coarse, sausage-shaped, hollow, perforated, papillae small, branchlets rather sparse, fibril present, without apothecia and isidia, medulla loose (Figure 4). Chemical test in medulla are C -, K + yellow, P + red, contain salazinic acid and stictic acid.

Figure 4. *Usnea esperantiana*, A. Morphology of thallus, B. Fibril, C. Medulla, D. Soredia. Scales: 0.5 mm

***Usnea strigosa* (Ach.) Eaton.** This lichen belongs to Parmeliaceae family. Thallus shrubby, base concolour (black and brown),

tufted, branches moderately papillate, with grey soredia, soralia absent, short fibril, apothecia lacking, and medulla dense (Figure 5). Chemical test in medulla are C -, K-, P-, contains diffractaic acid.

Figure 5. *Usnea strigosa*, A. Morphology of thallus, B. Fibril, C. Diffractaic acid. Scales: 0.5 mm

***Usnea subfloridana* Stirt.** This lichen belongs to Parmeliaceae family. Thallus shrubby to subpendent, base black, bushy, hollow, erect, main branches coarse with small spines, stout central axis, with green isidia and soredia, soralia convex, wart-like nodules lacking, fibril and papillae present, without apothecia, medulla dense (Figure 6). Chemical test in medulla are C-, K+red, P+ yellow to orange-red, contain squamatic acid and thamnolic acid.

Figure 6. *Usnea subfloridana*, A. Soredia, B. Soralia, C. Base black. Scales: 0.5 mm

***Usnea ceratina* Ach.** This lichen belongs to Parmeliaceae family. Thallus shrubby, solid, with green soredia, fibril and papillae present, irregular branches, consist of relatively few main branches with some subbranches, and constriction at intervals along the main branches, medulla dense, with strawberry pink pigmentation medulla (Figure 7). Chemical test in medulla are C -, K-, P+red, contain barbatic and squamatic acid.

Figure 7. *Usnea ceratina*, A. Morphology of thallus, B. Fibril, C. Pigmentation in the medulla. Scales: 0.5 mm

***Usnea glabrescens* (Nyl. ex Vain.) Vain.** This lichen belongs to Parmeliaceae family. Thallus subpendent with black base, hollow, bushy, without isidia and soredia, soralia rounded and green, apothecia absent (Figure 8). Chemical test in medulla are C -, K-, P+red, contain norstictic acid.

Figure 8. *Usnea glabrescens*, A. Morphology of thallus, B. Fibril, C. Soralia. Scales: 0.5 mm

***Usnea florida* (L.) F. H. Wi.** This lichen belongs to Parmeliaceae family. Thallus shrubby, soft, bushy, erect, hollow, with soredia and isidia, soralia absent, apothecia present, the main branches coarse with warth and small spine, a stout central axis, and medulla dense (Figure 9). Chemical test in medulla are C -, K-, P + red, contain thamnolic acid.

Figure 9. *Usnea florida*, A. Morphology of thallus, B. Apothecia, C. Thamnolic acid. Scales: 0.5 mm

***Usnea flammea* Stirt.** This lichen belongs to Parmeliaceae family. Thallus subpendent, base brownish, hollow, irregular and little branched, fibril present, with green soredia, rare soralia and isidia, apothecia absent, and medulla dense (Figure 10). Chemical test in medulla are C -, K+ red, P + red, contains stictic acid.

Figure 10. *Usnea flammea*, A. Soralia, B. Morphology of thallus, C. Stictic acid. Scales: 0.5 mm

***Usnea hirta* (L.) F.H. Wigg.** This lichen belongs to Parmeliaceae family. Thallus shrubby, yellowish green, hollow; soredia, isidia and soralia present, fibril present, papillae absent, apothecia absent, eroded, axis narrow, the main branched are ridged and especially the tips, apothecia absent, medulla loose (Figure 11). Chemical test in medulla are C -, K+ red, P + red, contains norstictic acid.

Figure 11. *Usnea hirta*, A. Morphology of thallus (fibril), B. Soralia, C. Norstictic acid. Scales: 0.5 mm

CONCLUSION

Eleven species of fruticose lichens have been found in this study. This research also found three new record species namely *Usnea strigosa*, *U. flammea*, and *U. esperantiana* in Java, from previous study *Usnea* in Java [8, 9]. The results of this study are expected to be the basis for further fruticose or another lichen research.

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