

Sinske HATTORI\*: **The status of *Jubulopsis*, a monotypic genus of Jubulaceae (Hepaticae)<sup>1</sup>**

服部新佐\*: ヤスデゴケ科 (苔類) の単型属 *Jubulopsis* の位置<sup>1</sup>

Schuster (1970) published a unique monotypic genus *Jubulopsis* [type: *Jubula novae-zelandiae* Hodgs. & Arn.=*Neohattoria novae-zelandiae* (Hodgs. & Arn.) Grolle=*Jubulopsis novae-zelandiae* (Hodgs. & Arn.) Schust.] which has leaves with many, ciliate marginal teeth, and stem underleaves which are deeply 4-lobed. His description, drawings, and discussions are excellent. Unfortunately it was known only in sterile state, but there seems to be no doubt about the validity of this plant as representing a proper genus. Since I have been studying Jubulaceae, I was much interested in this genus which is still known only from Stewart Island of New Zealand. Only recently was I able to study material of this taxon. The collection that I examined<sup>2</sup> was composed of several shoots bearing a few androecia.

The plant was pale olive to brown and more or less tinged with purplish-red in herbaria, and even when moistened it was flaccid and more or less soft. The main axis was 3-4 cm long, regularly bipinnately branched, with the primary branches 2-4 mm long, densely and more or less obliquely spreading (but occasionally elongate and ca. 1 cm long). Since Schuster (1970) gave such a detailed description, the following discussion will be limited to those features which Schuster (l.c.) failed to note, or in which our observations are not similar, or which are interesting for some other reason.

The cross-section of the main axis agreed with those of *Frullania* and *Jubula*, the cortical layer being composed of thick-walled cells in 2-3 layers, grading into thin-walled medullary cells. Branching was exclusively of the

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2) New Zealand. Stewart I., Mt. Anglem, Christmas Village, 50 m in alt., epiphytic on *Weinmannia*, ann. 1964, leg. G. A. M. Scott (ex OTA-7975) in herb. R. Grolle.

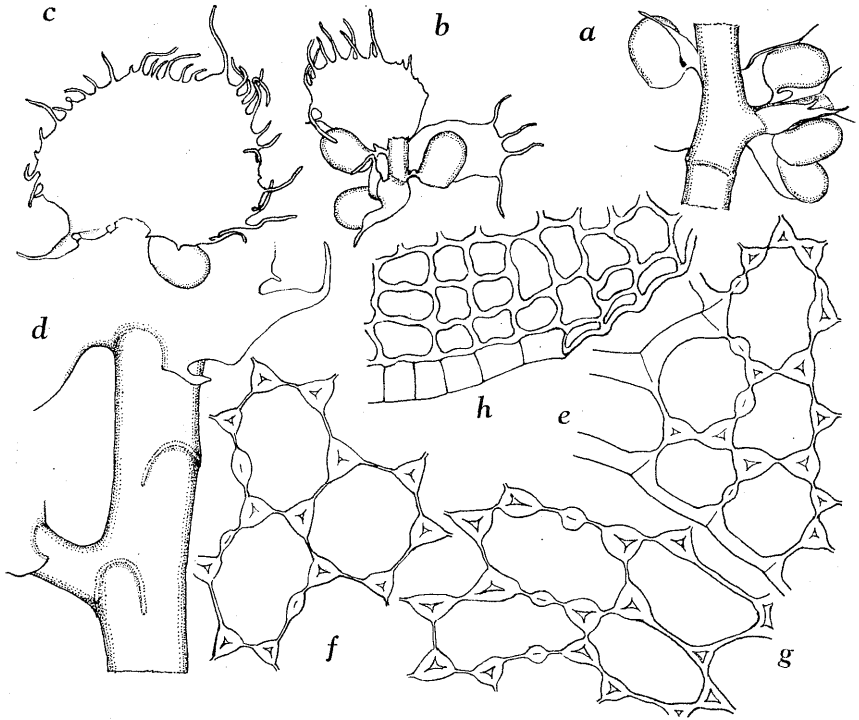


Fig. 1. *Jubulopsis novae-zelandiae* (Hodgs. & S. Arn.) Schust. *a*. Portion of stem, underleaf dissected away, showing initial and secondary leaves on branch, ventral view,  $\times 21$ . *b*. Portion of branch with initial leaf, secondary leaf, and third leaf, ventral v.,  $\times 21$ . *c*. Stem leaf, appressed, showing large, triangular basal appendage long-setose at apex,  $\times 21$ . *d*. Portion of stem, showing insertion line of leaf-lobes, dorsal v.,  $\times 44$ . *e-g*. Cells of stem leaf-lobe, fig. *e* from base of marginal cilium, fig. *f* from middle, fig. *g* from base, all  $\times 462$ . *h*. Margin of mouth of stem leaf-lobe, showing a row of hyaline marginal cells (and crenulate margin occurring at distal edge of mouth),  $\times 462$ . Drawn from specimen from New Zealand: Stewart I., Mt. Anglem, Christmas Village, 1964, leg. Scott (ex OTA-7975), in herb. R. Grolle.

terminal (collarless) *Frullania*-type, and on the branches the initial leaf was deeply 3-lobed (rarely 4-lobed or more rarely 2-lobed), with one or two of the lobes saccate (Fig. 1, *a-b*). The secondary leaf was almost normal, though the lobe was much smaller and few-ciliate than that of the third and successive leaves. The type of initial and secondary leaves on branches was exactly the same as that of *Frullania* (or Frullanioideae), and never

that of the *Jubula* (or Jubuloideae). The explanate lobes of the initial leaves were lanceolate, with acuminate and mostly long-setose apices and also one or two lateral teeth.

Cells of stem leaf-lobes had large, more or less nodulose trigones (and also occasional intermediate thickenings) and thin walls, without any pigmentation (hyaline or nearly so) except for the very basal cells which were more or less elongate and thick (Fig. 1, *g*), with trigones and walls more or less pale yellow (or almost hyaline).

Schuster (1970) wrote: "Branching uniformly of the *Frullania*-type, the branch always associated with an unlobed leaf whose insertion is *Jubula*-like (partly inserted on branch, partly on stem)." However, the material examined by me always had *Frullania*-type insertion (never extending on branches; see Fig. 1, *d*). Schuster (l.c.) wrote about the insertion-line of stem leaf-lobes: "subtransversely and narrowly inserted dorsally," whereas my observation revealed that the insertion was strongly arched and not very short; the line of insertion was arching upward on the stem semicircularly and ending 1/2 to 2/3 the stem width at or slightly below the level of base of leaf-keel (Fig. 1, *d*).

The stem leaf-lobes were more copiously ciliate along margin than Schuster's drawings (up to ca. 30 cilia per lobe), and their dorsal bases were usually appendaged (Schuster did not mention this). These appendages were occasionally elongate-triangular with long-setose tips (Fig. 1, *c-d*), though most appendages were smaller or not well-developed and merely more or less angulate-expanded.

The leaf-lobules that I observed had a single row of hyaline, very thin-walled marginal cells along the mouth (Fig. 1, *h*) except for the distal edge where 2-3 tangentially elongate, crenulate cells were seen. Such hyaline marginal cells of the lobule-mouth were also seen in *Schusterella microscopica* (Pears.) Hatt. et al. (Hattori et al. 1972). The lobule was similar in shape to that of *Jubula*, being more or less compressed and having a wide mouth with almost straight margins. The cells of the lobule (except the mouth-margin) were thick-walled and the walls were more or less sinuate, grading into larger trigones (Fig. 1, *h*). The stylus of stem leaf was remarkable (Fig. 1, *a*).

Dioicous? (gynoecia not seen): The androecium was short-stalked and

usually lateral on a longer branch. The stalk was always of the terminal (collarless) *Frullania*-type in branching and usually had no pair of normal leaves. The androecium was capitate with 2-3 pairs of densely imbricate bracts. The bract-lobes and bracteoles were much smaller than the normal leaf-lobes and underleaves, with marginal cilia poorly developed or almost lacking. The initial leaf on androecial branch (=stalk) was 2-3-lobed and its insertion was situated a little above the branch base (as in the case of the initial leaf on ordinary branches).

The above discussions and illustrations suggest that *Jubulopsis* may belong to the Frullanioideae rather than the Jubuloideae. In the genus *Jubula* the initial and secondary leaves on branches are both small, lanceolate, and never bilobed, the insertion of leaf-lobes is long (inverted J-shaped), the dorsal insertion of leaf whose lobule replaces a branch partly extends on the branch (*Jubula*-type), and the androecial branch is exclusively of the intercalary (sheathed) *Bryopteris*-type. *Jubulopsis* may be the genus nearest to an ancestral stock of the Jubulaceae, having many primitive features. I cannot deny an affinity of *Jubulopsis* to *Lepidolaena*, but the relationship may be a rather remote one.

Among the seven known genera of Jubulaceae (except Lejeuneoideae), *Jubula*, *Frullania*, *Neohattoria*, *Jubulopsis*, *Amphijubula*, *Steerea*, and *Schusterella*, I consider the *Jubulopsis* as the most primitive, and the second of most primitive probably is *Steerea*, though these two genera are never considered to be on the same evolutionary line. Recently Hattori et al. (1972) showed that the type species of *Neohattoria* is very closely related to *Jubula*, whereas the other members of *Neohattoria* are closer to *Frullania*, and for the latter members a new genus *Schusterella* was proposed. *Neohattoria* and *Schusterella* may be derived by reduction from *Jubula* (or its ancestral form) and *Frullania* (or its ancestral form), respectively. As for the monotypic genus *Amphijubula* known only from the Magellan Province in Chile, I consider it to be derived by reduction and much more closely related to *Frullania* than *Jubula*, but I wish to reserve further discussion until later.

#### References

- Hattori, S., A. J. Sharp, and M. Mizutani, 1972. *Schusterella*, a new genus of Jubulaceae (Hepaticae). Jap. Journ. Bot. (in press). Schuster, R. M.

1970. Studies on antipodal Hepaticae, III. *Jubulopsis* Schuster, *Neohattoria* Kamim., and *Amphijubula* Schuster. Journ. Hattori Bot. Lab. 33: 266-304, figs. 1-6.

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ニュージーランドの Stewart 島のみに知られる単型属 *Jubulopsis* は近頃 R.M. Schuster 教授に依り記載されたばかりであるが、ヤスデゴケ科の祖型と考えられる面白い属である。本科の研究に手をそめた私は標本に基いて他属との類縁関係を掘り下げて見たいと思った。その結果本科の中で最も原始的な特徴を保有し、Schuster 氏の見解とは反対にヤスデゴケ亜科に入ると考えるに至った。ヤスデゴケ亜科に属する根拠は (1) 雄花枝の分枝型が *Bryopteris* 型でなく、*Frullania* 型であること、(2) 枝の第1葉と第2葉が *Jubula* 型でなく、*Frullania* 型であること、(3) *Frullania* 型の枝を出す葉の上片の茎への着生線が決して枝に流れないこと、そして (4) 葉の上片の着生線が縦長でないこと、の4点である (3と4も共に *Frullania* 型である)。

□ 北村二郎・村田 源：原色日本植物図鑑，木本篇 (I)，索引共 400 頁，図版 72，挿図 237，保育社発行，Nov. 1, 1971。¥2,800。本書は保育社の原色図鑑第 49 篇で、既刊草本篇上・中・下 3 篇につづく木本篇の第 1 巻である。木本の合弁花類から逆行して、その全部と、離弁花類のウコギ科からマメ科までをとり扱っている。このシリーズの第 19 篇は、岡本省吾氏との共著の原色日本樹木図鑑で、本書はその姉妹篇のようなものであるようにも考えられるが、後者が写真から出来ているので、やゝもの足りないようなところもあるが、今回のものは、その点と増補の点で一段の進歩をしているので、重覆しているとはいきれない。その上、本篇は肉筆であるので、写真に比しそれぞれの持味に特色がある。木本はいうまでもなく草本とちがい、個体の一部を別々に表現するのだから、それぞれに特長があり、いろいろな角度から見る描写が利用者役に役立つ。なを本篇には異名をあげてあると共に、参考文献を巻末につけ加えてあるので研究者には重宝である。また、折込み附録である北村氏筆者の「幻の樹木図鑑」なる文章は、北村氏がかなり長期に亘りしらべていた事実を知っている筆者としては、まことに興味をもって一読した。これは、通りいっぺんの折込以上に努力したもので、本邦樹木誌の現在までの先輩各位の活動のあとを記録した、日本樹木誌史の概説ともいべきもので、むしろ本篇の前か末尾におくべきである。終りに続篇の発行をまつとともに、そのときは、折込でなく本文のどこかに加えるよう希望する。

(久内清孝)