p. 1, 3, 4: Nom. column

ISSN 0253-4738

The BRYOLOGICAL TIMES

Newsletter of the International Association of Bryologists

June, 1988 No. 47

ECOLOGY OF WEST ANATOLIAN LIVERWORTS

by Münir Öztürk and Isa Gökler

The Asiatic part of Turkey, commonly known as Anatolia, comprises 751,100 km^2 and is separated from the European part by the Bosphorus. Most of Anatolia is a plateau, rising steadily towards the East being bounded in the North and the South by steep mountain ranges. The climatic, geological and geographical contrasts have resulted in a very rich flora, which has attracted the attention of many botanists, including P. H. Davis, who has published 9 volumes of the "Flora of Turkey and East Aegean Islands", (Davis, 1946-86). A perusal of these volumes reveals little about the bryophytes of the region.

For information about bryophytes one should consult the papers by Juratzka and Milde (1870); Schiffner (1896, 1897, 1908, 1913); Penther & Zederbauer (1905); Reimers (1927); Bornmüller (1931); Bizot (1955); Henderson & Muirhead (1955); Henderson (1957, 1958, 1961, 1963); Jovet-Ast (1957); Fröhlich (1959); Robinson & Godfrey (1960); Walther (1967, 1970); Walther & Leblebici (1969); Townsend (1969); Henderson & Prentice (1969); Crundwell & Nyholm (1979); Gökler et al. (1984); Çetin & Yurdakulol (1958, 1986); Gökler & Öztürk (1986); Gökler (1986).

Most of these workers have concentrated their studies on the West Anatolian part of Turkey, between 36° - 41° North latitude and 26° - 30° East longitude, covering grid squares 6 and 11 (Henderson, 1961). In general this area enjoys a mediterranean climate, with hot dry summers and mild rainy winters; however, much variation in climatic parameters are met with in the area due to its varied topography. Thus Bodrum at the sea coast shows a mean annual temperature of 18.7° C and rainfall of 511 mm, whereas nearby Mugla experiences a mean annual rainfall of 759 mm and a mean temperature of 14.8° C. At increasing altitude and distance from the coast, climatic changes become stronger due to the presence of mountains up to ca. 2500 m high and big rivers such as the Gediz, Big Menders, Small Menders and Bakir. While Izmir has an annual mean temperature of 17.5° C and a rainfall of 520 mm, Usak in the East has a mean temperature of 12.0° C and a mean rainfall of 398 mm per year.

Up to 1982, 131 species of liverworts had been recorded from Turkey. *Pellia neesiana*, *Porella thuja* and *Mylia taylori* were added by Gökler et al. (1984), Gökler & Öztürk (1987) and Çetin & Yurdakulol (1986), raising the number to 134. Our latest findings have shown that 67 species belonging to 24 families occur in the Anatolian region. This number appears to be quite low compared to Europe. The main reason for this is that very few investigators have visited this area and mostly only for a limited period. In view of the fact that about 10,000 species of higher plants are recorded from Turkey, with an endemism ratio of 1/3, a much larger number of species of liverworts is expected to occur in this region.

Among the liverwort families found in West Anatolia, the Ricciaceae are the most prominent with 11 species of *Riccia* being known: *Riccia bicarinata*, *R. ciliata*, *R. ciliifera*, *R. crystallina*, *R. glauca*, *R. gougetina*,

(Continued on p.2)

A contribution to the Phytogeography and Ecology column edited by S. R. Gradstein and J. Váňa.

On Retroactivity

by Gea Zijlstra

In an earlier column (Bryol. Times, 46: 5) a survey was given of some important decisions, taken in the Nomenclature Section of the XIV IBC, Berlin 1987. It has been mentioned already that retroactivity was an important theme on which decisions have been postponed, through the establishment of a Special Committee on Retroactivity, Superfluity and Illegitimacy, to report to the XV IBC. Almost all proposals concerning retroactivity have been referred to this committee.

The immediate cause was uncertainty about the best answer to the question "Is lectotypification retroactive?". Another subject that in my opinion should be studied by this committee relates to the retroactivity of Appendices II and III of the Code.

Retroactivity of lectotypification

This topic has been the subject of many discussions already. An example from bryology is *Omphalolejeunea*, of the the very few Sprucean subgeneric epithets that was not raised to generic rank by Schiffner in 1893, although Lacouture did so in 1908. Spruce in 1884 in his *Lejeunea* subg. *Omphalolejeunea* included *Omphalanthus* Lindenb. et Nees, 1845 p.p. This genus originally comprised 87 species; Schiffner in 1893 retained it with *O. filiformis*, one (of the original) species only. This has always been considered as a lectotypification. (Following Berlin I am not sure if this

(Continued on p. 3)

A contribution to the Nomenclature Column edited by G. Zijlstra, Institute of Systematic Botany, Utrecht, The Netherlands.

West Anatolian Liverworts
(continued from p.2)

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On Retroactivity (continued from p.1)

can be retained since Schiffner did not use the word 'type'; but for simplicity of this example let us take Schiffner's action to constitute lectotypification). Those who consider lectotypification to be retroactive, woould argue that *Omphalolejeunea* is an illegitimate substitute name for *Omphalanthus*. Spruce included *Omphalanthus* p.p. only, but he did include its lectotype, *O. filiformis*.

In Index Nominum Genericorum lectotypification *is* always considered to be retroactive. At the generic level this kind of case can be detected in ING from the words "(by lectotypification)", e.g. for *Omphalolejeunea* : " ≡ *Omphalanthus* Lindenberg et Nees 1845 (by lectotypification)". This implies that the 1893 lectotypification is taken as working retroactively to 1884, when Spruce published his subgenus. In other words, it is taken as if Spruce should have known already that he was including the type of *Omphalanthus* . (In ING the "(by lectotypification)" is added, because a lectotypification later on can be proved to have been wrong. If this appears to be the case, of course, the illegitimacy (≡) is removed.)

Those who consider lectotypification not to be retroactive, would argue that *Omphalolejeunea* needs a lectotype, and an author may well have indicated one of the species that Spruce added to the taxon concerned. Happily in the case of *Omphalolejeunea* , this problem does not exist as Bonner et al. in 1961 indicated *O. filiformis* .

Retroactivity of Appendices II and III of the Code

This concerns names that were illegitimate when published but, for various reasons, for a long time or even always have been in use. An example from the orchids: *Goodyera* R. Brown 1913 was published with two species: *G. repens* and *G. pubescens* ; *G. repens* was based on *Satyrium repens* L. 1753. The latter was the only species, included by Séguier 1754 in his n.g. *Epipactis*. This genus has been neglected since then, until the sixties of this century, when it was added as a nom. rej. against *Epipactis* Zinn 1757, nom. cons. (The latter had been conserved already for several decades a.o. against *Helleborine* Miller, 1754.)

Nobody ever raised the problem that *Goodyera* was illegitimate WHEN PUBLISHED (under a certain interpretation of Art. 63), but the Sydney addition in Art. 6.4 ("A name which according to this Code was illegitimate when published cannot become legitimate later unless it is conserved") certainly presents a threat to the status of this category of names. Even though the Sydney addition had been made under the argument that it was not the intention to introduce any change.

Dandy (1967) had no problem in adding "≡ *Goodyera* R. Br. 1813" as the name to be used for the newly detected *Epipactis* Séguier. If we can consider App. II to be retroactive, there is no problem indeed: then *Goodyera* can be considered as legitimate when published.

"Berlin" has not been consistent with proposals about this question: Prop. F. to Art.6, designed for this kind of case at the generic level, was rejected; Prop. G, designed for infrafamilial names, was accepted;
(continued on p. 4)

On Retroactivity (continued from p. 3)

Prop. H, not restriced to any rank, was rejected again. The main reason to accept G and reject F, seems to be that the proposer (Nicolson) changed his mind, and was still in favour of G, but not any longer of F.

If you come across a case in which you conclude either that it is quite convenient to accept retroactivity, or to reject it, please let me know. I will be a member of that committee, and I think we need many examples.

The committee will also study the connection between Art. 7.11 and Art. 63.

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BRYOPHYTE FOSSILS IN AMBER

By
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A major reason for the deplorable uncertainty of bryophytic phylogeny, and hence of the taxonomic arrangement of bryophytes, is the great rarity of fossils (see Krassilov & Schuster, 1984 for review). In addition, most fossils are very poorly preserved. This is equally true for both hepatics and mosses. Reflecting the author's more extensive knowledge of the former group, this account is restricted to fossil hepatics and especially focuses attention on specimens preserved in amber (Grolle, 1981c).

Among the few examples of structurally, rather well-preserved hepatics from the Palaeozoic are: *Pallaviciniites devonicus* (Hueber) Schust., 1966 (Devonian: N. America); *Hepaticites kidstonii* Walton, 1925 (Carboniferous: Scotland); *Blasiites lobatus* (Walton) Schust., 1966 (Carboniferous: Scotland) and *Gessella communis* Poulsen, 1974 (Permian; Denmark). Those from the Mesozoic are even scarcer: *Diettertia* Brown et Robinson, 1974 (Cretaceous: N. America); *Naiadita lanceolata* Brodie (Jurassic: S. England, Harris, 1939): *Metzgeriites glebosus* (Harris) Steere, 1947 (Jurassic: Britain); and *Sporangioceros nipanicus* Sharma et al., 1984 (Jurassic: India, Sharma & Suthar, 1986). Surprisingly the fossil records of well-preserved hepatics from the Tertiary are especially scanty. There are some Tertiary spores which have been identified as hepatics, e.g. *Anthocerisporis* Krutzsch, 1967; *Bohemiasporis* Krutzsch, 1967; *Saxosporis* Krutzsch, 1963; and *Zlivisporis* Pacltova, 1961.

All other positively identifiable Tertiary fossils of hepatics are from amber. In the main the latter are outstandingly well preserved but, unaccountably, have long been neglected. A recent revision of such specimens by the author has brought several new records to light. The present state of knowledge is set out in Table 1.

Unexpected results that emerged from this re-examination of the Tertiary fossils include the detection of

EUROPEAN origin	Baltic amber	Saxonian amber
Bazzania polyodus (Caspary, 1887) Grolle, 198	!	
Calypogeia stenzeliana Grolle, 1985a		!
Cephaloziella dimorpha (Caspary, 1887) Grolle, 1980	! m	(!)
Cheilolejeunea latiloba (Caspary, 1887) Grolle, 1984a	!	! f
Frullania acutata Caspary, 1887, Grolle 1981b, 1985c	!	
Frullania baltica Grolle, 1985c	!	
Frullania casparyi Grolle, 1985c	!	(!)
Frullania schumannii (Caspary, 1887) Grolle, 1981a, 1985c	! m+f	
Frullania truncata Caspary, 1887, 1907, Grolle, 1985c	!	
Frullania varians Caspary, 1887, 1907, Grolle, 1985c	! m +per	(!)
Jungermannia berendtii Grolle, 1980	!	
Lejeunea alifera Caspary, 1907, Grolle, 1985b	!	
Nipponolejeunea europaea Grolle, 1981b	!	
Radula bitterfeldensis Grolle, 1985a		!
Radula oblongifolia Caspary, 1887, 1907	!	(!)
Radula sphaerocarpoides Grolle, 1980	!	(!)
Spruceanthus polonicus Grolle, 1985b	! f	
Trocholejeunea contorta (Göppert et Berendt,1845) Gradst. et Grolle in Grolle, 1982	!	(! per.)

NEOTROPICAL origin	Dominican amber	Mexican amber
Bazzania oleosa Grolle in Grolle & Braune, 1988	!	
Bryopteris succinea Grolle, 1984c	! m	
Cyclolejeunea archaica Grolle, 1984c	! (f)	
Cyrtolejeunea suzannensis Grolle, 1984b	!	
(*Drepanolejeunea* sp.)	(!)	
(*Frullania* sp.)	(!)	
Lejeunea palaeomexicana Grolle, 1985d		!
(*Lejeunea* sp.)	(!)	
Leucolejeunea antiqua Grolle, 1983	!(m+ per.)	
Prionolejeunea sp. 1986	!	
Radula steerei Grolle, 1987	!	
(*Stictolejeunea* sp.)	(!)	

Table 1. Hepatics so far identified from amber (all from the Tertiary). ! = verified record; m = male gametoecium; f = female gametoecium; per. = perianth; ( ) = unpublished.

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