
The taxonomic status of *Fontinalis mollis* and *F. antipyretica* var. *cymbifolia* with the description of *Fontinalis antipyretica* var. *rotundifolia*

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Abstract: During the past years, *Fontinalis* specimens with round, concave leaves were collected in Germany and Spain, which were named as *F. antipyretica* var. *mollis*. A comparison with the type of *F. mollis* revealed that they are not identical and accordingly are described as new variety, *F. antipyretica* var. *rotundifolia*.

Zusammenfassung: In der letzten Zeit wurde zwei Mal, aus Deutschland und Spanien, *Fontinalis* Proben mit eigenartig runden hohlen Blättern gefunden, welche als *F. antipyretica* var. *mollis* bezeichnet wurden. Ein Vergleich mit dem Typus von *Fontinalis mollis* ergab, dass diese Proben nicht mit diesem Taxon identisch sind, weswegen sie als *F. antipyretica* var. *rotundifolia* neu beschrieben werden.

During the past years, very strange specimens of *Fontinalis* with concave, not keeled, rounded leaves have been found in Germany (Frahm 2009) and also Spain (Frahm 2013, fig. 1). In both cases, the plants grew associated with the typical variety of *F. antipyretica*. Therefore it was suggested that these are somatic mutants of var. *antipyretica*.

A search for names which could be used for these specimens revealed two taxa, *Fontinalis antipyretica* var. *mollis* described from western North America and *F. antipyretica* var. *cymbifolia*, described from England.

Fontinalis antipyretica Hedw. Spec. Musc. 298, 1801

var. *cymbifolia* Nichols. J. Bot. 39: 427, 1901

Fontinalis mollis Müll.Hal., Bot. Centralbl. 44: 421, 1890

Fontinalis antipyretica var. *mollis* (Müll.Hal.) Welch in Grout, Moss Fl. N. Am. 3: 237, 1934

The var. *mollis* was applied to these collections, however, merely based on descriptions in the literature. Therefore the type material of both taxa were obtained by loan from the New York Botanical Garden (NY), which are included the herbarium of Winona M. Welch, the late *Fontinalis* specialist.



Fig. 1: *Fontinalis antipyretica*, Typical expression (top), mixed with curious expression with rounded concave, not carinate leaves (from Frahm 2013).



Fig. 2: Isotype of *Fontinalis antipyretica* var. *cymbifolia* Nichols. (NY)

The study of the types revealed the following:

Fontinalis antipyretica var. cymbifolia Nichs. “England, the Ouse near Lewes, Sussex, Aug. 1900, coll. W.E. Nicholson (Three isotypes, NY). The type was placed to *F. antipyretica* var. *laxa* (Milde) Limpricht by Welch in 1941.

The description of this taxon is very vague and partially does not fit the type material. Mönkemeyer (1927) describes it as weak plants and weak leaves with broadly acuminate leaves. He compares it with *fo. laxa* (Warnst.) Milde as Welch (1960) did. The type material shows that the leaves are not broadly acuminate but quite “normal” in dimensions (as in the typical variety) but are not carinate. This is the only character in common with the strange plants from Germany and Spain mentioned above.

Fontinalis mollis Müll.Hal. “Nord-America, Astoria, Oreg., Pfähle im Columbia River. C. Röhl 15.7.88 (Isotype NY, holotype destroyed in B; the specimen is not lectotypified here since it lacks capsules, which are described in the protologue). The species was reduced to the rank of a variety by Welch in 1934.



Fig. 3: Isotype of *Fontinalis mollis* (NY).

The protologue of this species is very articulate but (as usually in descriptions made by Carl Müller) less informative. The type has carinate leaves with slightly obtuse and concave apices (in contrast to the protologue which describes the leaves as “late ovata”) and is generally not much different from *F. antipyretica*. The protologue describes capsules, which are not present in the specimen kept in NY.



Fig. 4: Leaves of the types of (from left to right) a. *F. antipyretica* var. *cymbifolia*, b. *Fontinalis mollis* and c. *F. antipyretica* var. *rotundifolia*.

The study of the type specimen of *Fontinalis mollis* revealed that the name was wrongly applied to the specimens described and illustrated from Germany and Spain by Frahm (2009, 2013), see fig. 4, where leaves of all taxa in question are compared. Due to the lack of any alternative names, this taxon has to be described as new. The fact that these specimens were always associated with the typical variety of *F. antipyretica* leads to the conclusion that it is a somatic mutant of the latter and is therefore best described as a new variety of the latter:

Fontinalis antipyretica Hedw. *Spec. Musc.* 298, 1801

var. *rotundifolia* J.-P. Frahm var. *nov.*

Plants laxly and distantly foliate. Leaves broadly ovate, very concave, almost as long as wide, with obtuse tips, not or only slightly carinate.

Type: Deutschland. Nordrhein-Westfalen, Oberbergischer Kreis, Rösrath, submers in der Sülz, 7,213378° E, 50,942857 N, 85 m alt., leg. Frahm 17.10.2009 no. 11765 as *Fontinalis antipyretica* var. *cymbifolia* (Holotypus), hb. Frahm in BONN. Fig. 4c, 6.

Spanien, Asturien, Rio Puron bei Llanes und Puron, Bachtal, submers, -4,700197° W, 43,385116° N, 27 m alt., leg. Frahm 2.3.2013 no. Sp-012 as *Fontinalis antipyretica mollis* (Syntypus), hb. Frahm in BONN. Fig. 1,5.

Literature

Frahm, J.-P. 2009. *Fontinalis antipyretica* var. *mollis* in Deutschland. *Archive for Bryology* 56, 5 pp.

Frahm, J.-P. 2013. Remarks on bryophyte collections from N-Spain including the first record of *Dicranodontium didymodon* in Europe. *Archive for Bryology* 164, 12 pp.

Welch, W.H. 1960. A monograph of the Fontinalaceae. The Hague, 357 pp.



Fig. 5: *Fontinalis antipyretica* var. *rotundifolia*, syntype.



Fig. 6: *Fontinalis antipyretica* var. *rotundifolia*, holotype.