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*Isoetes duriei* New to Lebanon

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## SHORTER NOTES

***Isoetes duriei* New to Lebanon.**—In a recent paper, we (Bolin *et al.*, Turkish Journal of Botany 32:447–457. 2008) discussed the taxonomy and distribution of the quillworts (species of the genus *Isoetes*, Lycophyta) in Western Asia. In this supplementary note, we record the presence of three quillworts new to Lebanon—one a widespread Mediterranean species, one known from only a single site in Turkey and two in Syria, and an undescribed new species. With this report, the number of documented species in Lebanon has increased from one to three. Voucher specimens will be deposited at BEI, E, and ODU.

In his flora, Mouterde (*Nouvelle Flora du Liban et de la Syrie*. Beirut: Editions de L’Imprimerie Catholique. 1966) included two species of *Isoetes* from Syria and Lebanon—*Isoetes olympica* A. Braun known from only a few sites on Jebel Al Arab (historically known as Jebel Druze) in extreme southeastern Syria, and what Mouterde called *I. histrix* Bory forma *subinermis* Durieu from the Akkar region of northern Lebanon. He separated the two species chiefly on the basis of velum coverage—*I. olympica* with an incomplete velum and *I. histrix* forma *subinermis* has complete velum coverage. Musselman (*Fern Gaz.* 16(6, 7 & 8):324–3 29. 2002) noted the impending demise of the Jebel Al Arab populations due to habitat destruction. However, in 2007 populations of *I. olympica* were found at several sites in the vicinity of Homs, Syria (Bolin *et al.*, 2008).

In April 2009, we located thousands of quillworts at several different sites in the Akkar region of extreme northern Lebanon, a region of basalt derived soils. Examination of the megaspores showed clearly that they are *I. duriei* Bory, a Mediterranean species previously unknown in the eastern Mediterranean with the closest populations in Turkey (Bolin *et al.*, 2008). Unlike most species of quillworts, *I. duriei* is terrestrial and grows in typical garrigue (degenerated Mediterranean forest) vegetation. Plants were small and initially difficult to locate among the grasses and forbs. Based on the large number of plants we saw, it is hard to understand how this plant could have been overlooked after more than a century and a half of botanical studies in Lebanon. This may be due to their maturation as early as mid-April, plants were beginning to senesce and had mature spores at this stage. The large megaspores of *I. duriei* with distinctive alveolate ornamentation are easy to recognize, being among the most distinctive in the genus.

Near the village of Kfar Noun, especially robust plants of *I. olympica*, readily discerned by the incomplete velum and much smaller tuberculate megaspores, were abundant in a vineyard among numerous *I. duriei*. *Isoetes olympica* has never been reported from Lebanon. For almost a century, *I. olympica* was known only from the type locality near modern day Bursa, Turkey. In the 1930’s several populations were found at Jebel Druze (Musselman, 2002). The discovery of large populations near Homs and the recently discovered Akkar plants strongly suggests that *I. olympica* has a much wider distribution and is

more abundant than previously thought. It should be sought at additional sites in Syria, as well as eastern Turkey and Iraq. Images of *I. olympica* and *I. duriei* from Akkar are at: <http://www.odu.edu/~lmusselm/plant/index.php>

In addition to *I. olympica* and *I. duriei* we found a third species which is apparently new to science. Hybrids are known from most places in the world where two or more species grow together and we have recently noted the first hybrids involving *I. duriei* (with *I. histrix*) (Bolin *et al.*, 2008).

The addition of these species to the flora of Lebanon is significant for two reasons. It is the first report of *I. duriei* in the eastern Mediterranean. We have also documented new populations of *I. olympica* formerly thought to be of great conservation concern. The only quillwort we have not yet found in Lebanon is *I. histrix* forma *subinermis* (sometimes known as *I. subinermis* (Bory) Cesca & Peruzzi, see Bolin *et al.*, 2008). Because this taxon, sensu Mouterde, has a complete velum, it must include *I. duriei* and *I. olympica*. It is likely that additional quillwort species could be found in the eastern Mediterranean and we hope that this note will help botanists be aware of these easily overlooked plants.—LYTTON J. MUSSELMAN and MOHAMMAD S. AL-ZEIN, Department of Biological Sciences, Old Dominion University, Norfolk, Virginia 23529-0266, USA.