

VARIATION OF *Hyla savignyi*: A COLOR PATTERN OF CYPRIOTE AND MAINLAND POPULATIONS

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INTRODUCTION

Audouin (1809) distinguished *Hyla savignyi* from *Hyla arborea* (Linnaeus, 1758) on the basis of its different color pattern (absence of upward loop on the lateral dark stripe). Later, Boulenger (1882) mentioned the former taxon as a variety of *H. arborea* whereas Nikolsky (1918) gave it a subspecific rank. More recently, Schneider and Nevo (1972) referred to differences in the mating calls of the both taxa and proposed to elevate the former one to the specific level. This approach was followed by number of other authors and today the name *H. savignyi* is widely used for the tree frog populations distributed in southern and eastern Turkey, Transcaucasia, western Iran, Iraq, Levant, north-eastern part of Sinai, Cyprus, and south-western part of Arabian Peninsula. Nevertheless, except of the description of the general coloration of *H. savignyi*, till now there are no available data dealing more thoroughly with the color pattern of this species and its possible geographical variation.

Examining the morphological variation of *H. savignyi* we noticed remarkably frequent occurrence of spotted to striped dorsal color pattern in Cypriote population. The aim of this brief report is (i) to draw attention to this phenomenon, (ii) to describe the patterned form of dorsal coloration of *H. savignyi*, and (iii) to quantify the geographic distribution of this form.

MATERIAL AND METHODS

The material consisted of 599 museum specimens of *H. savignyi* from its whole distribution area. Additional data were collected directly in the field in Cyprus, Turkey, Syria, Lebanon, Israel and Jordan. The comparison of the color pattern of the Cypriote population with the population from adjacent mainland (Mediterranean zone of Tur-

key, Syria, and Lebanon) was based on 421 specimens (Cyprus: 240, mainland: 181; see Fig. 1 for localities).

Variation in the dorsal color pattern consists in presence, shape and arrangement of dark dorsal spots, which, according to our observation on living specimens, can undergo on the background color independent color changes. We defined two basic groups of color pattern for needs of our study: (i) pattern-less and (ii) patterned. The latter was subdivided into two subgroups: (ii-a) spotted, individuals bearing irregularly distributed spots; (ii-b) striped, individuals with more or less complete longitudinal stripes formed by oblong spots. Pattern of dark permanent little dots, which occurred in *H. arborea* too, was omitted within our investigation of the dorsal color pattern.

RESULTS AND DISCUSSION

The examination of the studied material revealed that the frequency of the patterned specimens is higher in the Cypriote population than in the populations from the other parts of the range of *H. savignyi*. The comparison proper of the samples from Cyprus and the adjacent mainland approved a significantly higher occurrence of patterned specimens in the island population (45.4%, 109/240 vs. 23.2%, 42/181, $\chi^2 = 22.13$, $df = 1$, $p < 0.0001$; Fig. 2). There was also a significantly higher occurrence of striped

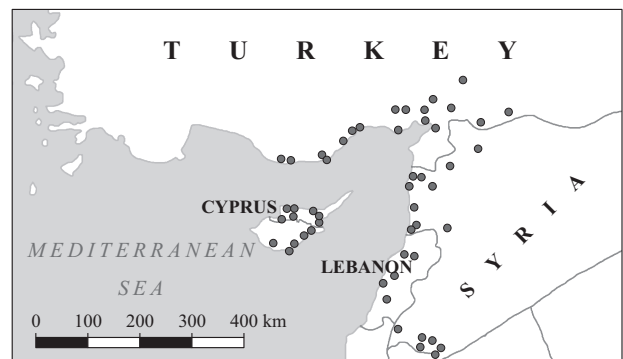


Fig. 1. Schematic map of localities of the material examined.

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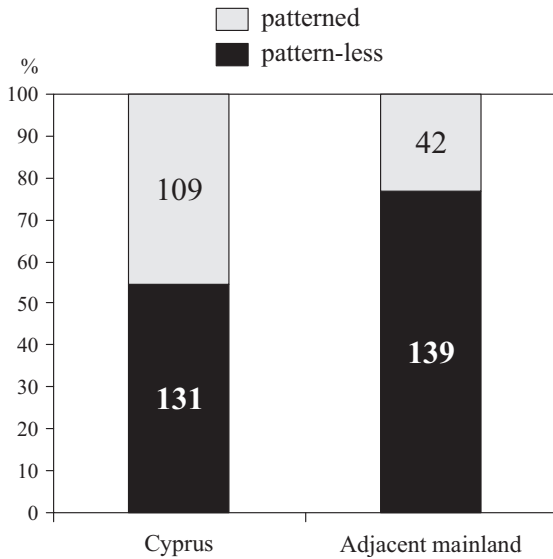


Fig. 2. Comparison of ratios of patterned specimens.

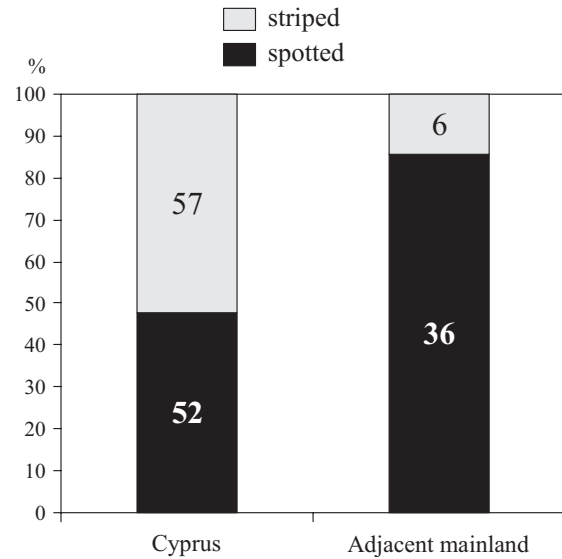


Fig. 3. Comparison of ratios of striped specimens within patterned specimens.

individuals within the patterned part of the Cypriote population (52.3%, 57/109 vs. 14.3%, 6/42, $\chi^2 = 18.01$, $df = 1$, $p < 0.0001$; Fig. 3).

The dorsal color pattern can be more or less obvious in dependence of the current physiological conditions. According to our observations from the field and captivity, the intensity of the dorsal color pattern changes in dependence on daily cycle and on activity of frog. The color pattern is more visible at nights, when the spots/stripes turn from green (different tone from background color) to dark brown or black. Nevertheless, it is obvious during daytime too. Interesting finding is that already Boulenger (1898) mentioned the striped or spotted pattern in *H. savignyi* (at that time as *H. arborea* var. *savignyi*) on page 251: “Some specimens (Cyprus) have four stripes or series of spots in addition to the lateral.” He also supplied this record by figure of Cypriote specimen on plate XV (see Fig. 4).

Our findings indicate that Cypriote population of *H. savignyi* has undergone a certain degree of differentiation from the mainland populations. These findings are also supported by our other morphological and bioacoustic data. The most obvious difference is in body size. Tree frogs of Cypriote population are significantly smaller than tree frogs from adjacent mainland (Gvoždik et al., in preparation). Already Schmidtler (1984) gave notice of this phenomenon. He considered Cypriote tree frogs as a “dwarf form” of supposedly subspecific status. On the other hand Böhme and Wiedl (1994) discussed weak insular endemism of the herpetofauna of Cyprus. One of the possibilities how to answer this problem is the insufficient knowledge of amphibians and reptiles biodiversity in the region

of eastern Mediterranean. The study pointing to specific status of Cypriote water frogs could be used as an example (Plötner et al., 2001). Tarkhnishvili and Gokhelasvili (1999) wrote about tree frogs from Cyprus that they “are morphologically similar to *H. savignyi*, although nowadays they are assumed to represent different species.” This information is very interesting but certainly incorrect, be-



Fig. 4. Illustration of a Cypriote specimen of *H. savignyi* published by Boulenger (1898: Plate XV, Figure 3).

cause no particular investigations of variation of *H. savignyi* have been accomplished neither from Cyprus nor from other parts of the distribution range so far.

Therefore, taxonomic status of Cypriote tree frogs needs further verification on the basis of particular morphological, bioacoustic and genetic studies.

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