BIOLOGICAL DIFFERENTIATION AND REPRODUCTIVE ISOLATION OF SYNTOPIC CENTRAL ITALIAN POPULATIONS OF *CHALCOLESTES VIRIDIS* (VANDER L.) AND *C. PARVIDENS* (ARTOBOL.) (ZYGOPTERA: LESTIDAE)

Populations of *C. viridis* and *C. parvidens* coexist in syntopy in at least one pond near Rome, Italy, where they generate both pure and hybrid offspring. The specific status of the two taxa was recently recognised on the basis of electrophoretic assays (M. COBOLLI et al., 1994: *Atti 17° Congr. naz. ital. Ent.*, pp. 77-82). A preliminary investigation has shown that different activity times of the two syntopic populations probably help in keeping them isolated. Further investigation of large samples from both syntopic and allotopic populations, has confirmed an average genetic distance between the two taxa at a specific level (D_{NEI} = 0.586 - 7 diagnostic loci out of 16 checked) and the separation of activity times at the pond, with peaks at noon and at 14.00 h in *C. parvidens* and *C. viridis*, respectively. F-1 hybrid specimens, heterozygous in all the diagnostic loci, represent 4.7% of the overall sample, the same as the percent of heterospecific tandems (4.6%; females were identified by electrophoresis). The males of the two taxa do not only differ in the shape of the cerci, but also in the shape of the inferior anal appendages and of the profallus. F-1 hybrids have cerci of intermediate shape, while in F-n hybrids, the cerci resemble those of either parents. Last instar larvae differ in the shape of the proximal segment of the labial palpus, which shows a larger denticle in *C. viridis* than in *C. parvidens*. Total body length of syntopic *C. viridis* is significantly larger than that of syntopic *C. parvidens*. Not so total body length of allotopic populations of *C. viridis* from central Italy, while a sample of *C. parvidens* from Greece averages significantly larger than a sample of *C. viridis* from Spain. In the examined syntopic populations, tandem males averaged a larger body length than unpaired males, although the difference was significant only in *C. parvidens*. In 1995, emergence was recorded between June 2 – July 28 in *C. parvidens*, and between June 28 – July 28 in *C. viridis*; the respective curves peaking on June 23 and July 21, respectively. Countings of exuviae, collected on three non-consecutive days every week, gave a total of 1977 males and 1664 females of *C. parvidens* (δ:♀ ratio = 1.2:1; χ^2 = 26.7; $P < 0.01$) and 292 males and 355 females of *C. viridis* (δ:♀ ratio = 0.8:1; χ^2 = 5.9; $P < 0.01$). The prereproductive period lasted roughly 8 weeks in *C. parvidens* (that emerged earlier) and 5 in *C. viridis* (that emerged later). All throughout the prereproductive and reproductive periods, *C. parvidens* was much more abundant than *C. viridis*. From the above, the two syntopic populations appear biologically well differentiated, although some genetic compatibility does occur. In the period of the day in which both species are active at the pond, the probability of meeting females is greater for *C. parvidens* males, since these are in a larger number than *C. viridis*

males. However, the likelihood of mixed copulations is greatly reduced by different activity times and by different shapes of male anal appendages. Furthermore it is possible that in seizing *C. viridis* females, the *C. viridis* male's greater size enables it to outcompete the male of *C. parvidens*, this compensating for the greater probability of the latter of meeting these females. Thus in syntopy, the different size between the males of the two species might also represent a mechanism which enhances reproductive isolation.

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