

assumed. He reported this hybrid from two localities in South Germany. All 11 hybrid colonies in our study are from loc. 7, where both parent species occurred abundantly (Table 7). The approximately equal numbers of parent and hybrid colonies at this site suggest that *L. nigriceps* and *L. "tubero-interruptus"* easily hybridize when they co-occur. There are no indications, however, that hybrids backcross with any of the parents since *L. nigriceps* and *L. "tubero-interruptus"* were monomorphic for MDH-1 F and M, respectively.

In these cases of hybridization, where *L. nigriceps* is involved, there exists an asymmetry, as is the case in *Lasius niger* × *L. alienus* (PEARSON 1983), implying that *L. nigriceps*, offering the cheaper sex (males) is the least suffering party.

There is no doubt that *L. unifasciatus* and *L. "tubero-interruptus"* hybridize, but the precise nature of the hybrid colonies we found is not known, since there were no clearcut differences between the parent species (they mainly differed in PGM). Considering the difficulties in discriminating between *L. unifasciatus* and *L. "tubero-interruptus"* at the site, where we found six of the seven hybrid colonies, we believe that hybrid sexuals are fertile and backcross at least with *L. unifasciatus*. Thus, some of our hybrid colonies and the misclassified *L. unifasciatus* as well might have been the result of such backcrosses. It might be interesting to note, however, that laboratory crossings between these species produced but a few, small and short-lived workers (PLATEAUX 1978).

The only information we have about the inclination of *L. tuberum* to interbreed with other species is from the small sample from loc. 21 that was sent to us since the collector (B. SEIFERT) suspected two of the colonies to be *L. "tubero-interruptus"* × *L. tuberum* hybrids, as was later supported by the allozyme analysis. However, since we know almost nothing about allozyme variation in *tuberum* between Sweden and the Alps, it cannot be ruled out that the MDH-2 M allele is naturally occurring in *L. tuberum* and, hence, that these colonies are pure *L. tuberum*, although worker morphology in one of the colonies points to a hybrid origin.

Premating isolating mechanisms have apparently evolved between the two frequently co-occurring species *L. nigriceps* and *L. unifasciatus*, whereas *L. "tubero-interruptus"* easily interbreeds with these two species. The restricted distribution of *L. "tubero-interruptus"* might in fact be explained by the breeding competition from the other species. Since, as far as we understand, *L. "tubero-interruptus"* hardly can escape the presence of at least *L. unifasciatus*, the question is how *L. "tubero-interruptus"* can prevail to exist. We have no answer, but we recognize the fact that our study area comprises only a peripheral part of the range of these species (AGOSTI and COLLINGWOOD 1987; BARONI-URBANI 1971; PLATEAUX 1978; own obs.) and that there might be ecological or other differences further south that prevent hybridization.

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### Zusammenfassung

#### *Arthybride und Variabilität in der Leptothorax tuberum-Gruppe (Hymenoptera: Formicidae)*

Anhand morphologischer und enzymelektrophoretischer Untersuchungen wurde festgestellt, daß in Nordwesteuropa vier verschiedene Arten der *Leptothorax tuberum*-Gruppe vorkommen: *L. tuberum* vorwiegend im Norden, aber *L. nigriceps*, *L. unifasciatus* und *L. "tubero-interruptus"* meist sympatrisch im Süden. Wir konnten auch nachweisen, daß Hybridisierungen vorkommen und Bastardvölker auftreten. *L. unifasciatus* und *L. nigriceps*, die häufig zusammen vorkommen, bastardieren selten, während *L. "tubero-interruptus"* offensichtlich leicht mit den anderen Arten kreuzt. Die Bastard-Arbeiterinnen nehmen in morphologischen Merkmalen eine Mittelstellung zwischen den Elternarten ein, doch ist der Bastard *L. nigriceps* × *L. "tubero-interruptus"* interes-