

## MOLECULAR EPIDEMIOLOGY OF *MYCOPLASMA CONJUNCTIVAE* IN CAPRINAE: TRANSMISSION ACROSS SPECIES IN NATURAL OUTBREAKS

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### Extended abstract

*Mycoplasma conjunctivae* is the etiological agent of infectious keratoconjunctivitis (IKC), a highly contagious ocular infection that affects both domestic and wild Caprinae species in the European Alps (1). In order to study the transmission and spread of *M. conjunctivae* across domestic and wild Caprinae populations, we developed a molecular method for subtyping and identifying of strains of *M. conjunctivae* (2). This method is based on DNA sequence determination of a variable domain within the gene *lppS*, a gene that encodes an antigenic lipoprotein of *M. conjunctivae*. This domain remains constant upon passaging strains on growth medium. However the *lppS* domain shows variations among different strains and thus allows their identification and also the estimation of their phylogenetic intercorrelations. The variable domain of *lppS* is amplified by PCR using primers that match conserved sequences of *lppS* flanking it. Sequence analysis of the amplified fragment enables fine subtyping of *M. conjunctivae* strains. The method is applicable directly to clinical samples without requesting the cultivation of the strain.

Among the different isolates from sheep, goat, chamois and ibex from European Alpine regions, the typing method was able to distinguish 16 different strains. Of particular interest were four isolates from diseased chamois in the Salzach valley in Austria which were shown to have the same *lppS* sequence. After diagnosis of *M. conjunctivae* in these chamois, eye swabs from a few sheep that were grazing in these pastures and that showed signs of potential *M. conjunctivae* infections were analyzed. Among 3 positive samples, one isolate showed the same *lppS* sequence as the latter four isolates from chamois. A second situation where the same *M. conjunctivae* strain was found in chamois and in sheep grazing in the vicinity was discovered in the San Bernardino region, Switzerland. Thus, our study revealed that the same *M. conjunctivae* strains could be isolated from chamois with IKC and from sheep that were grazing on the same pastures showing that *M. conjunctivae* can be transmitted between domestic small ruminants and free-ranging wild Caprinae. This confirms previous speculations from sero-epidemiological surveillance of *M. conjunctivae* infections in sheep (3) and chamois (4). These studies showed the domestic sheep population to be a reservoir of *M. conjunctivae* from which alpine chamois, which do not maintain the infection themselves, were considered to be infected by mainly neighboring sheep populations. Two particular cases showed that sheep can get infected by two different strains simultaneously: two distinct isolates were found in the same sheep, one in the left eye and the other in the right eye, and two other isolates could be separated as two different strains but originated from the same eye of a particular sheep. Finally the surprising finding that a female chamois and her two months old kid, both affected with IKC, carried two different strains of *M. conjunctivae*.

In summary, we have developed a molecular method for subtyping individual strains of *M. conjunctivae* based on the variable segment of the gene *lppS*. This method allowed us to perform a molecular epidemiological study of *M. conjunctivae* in Alpine regions and to demonstrate the possibility of transmission of *M. conjunctivae* between domestic sheep and wild Caprinae.

## Zusammenfassung(??)

## Résumé (??)

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**Key words:** Alpine chamois, DNA sequence determination, domestic sheep, European Alps, infectious keratoconjunctivitis, molecular epidemiology, *Mycoplasma conjunctivae*, PCR.

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