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Host selectivity of gall-inducing sawflies (Hymenoptera, Tenthredinidae) on willows (*Salix* spp.):

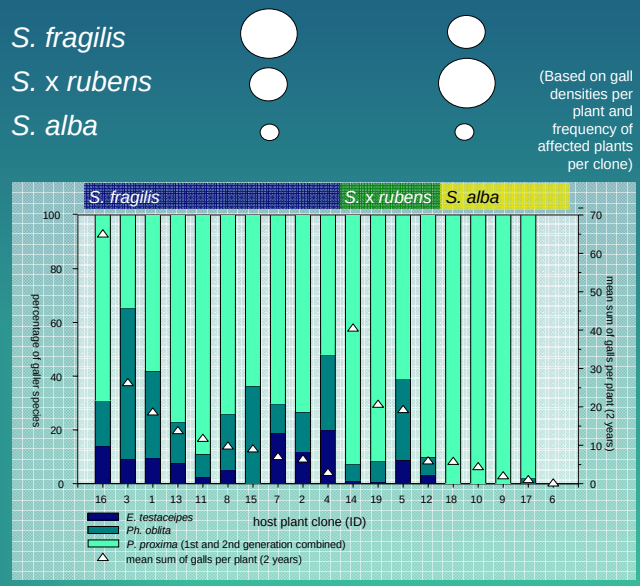
Signal effects or resource limitation?

The host plant selectivity of *Euura testaceipes*, *Phyllocolpa oblita* and *Pontania proxima* (Hymenoptera, Tenthredinidae) was investigated using 19 clones representing the host plant spectrum (*Salix alba/S. fragilis*-aggregate). The clones were assigned to three taxonomic groups (*S. alba, S.* x *rubens* and *S. fragilis*) according to molecular and morphological characteristics. The analysis of multiple phenotypic plant characteristics among the 19 clones revealed three main factors**:

1) leaf morphology and size,
2) plant size and growth and
3) foliation phenology.

Quantification of galls on the ~240 plants and comparison with the main factors led to the following explanation for the distinct host plant selectivity of these sawfly species:

Host plant selectivity*



Multiple regression, R^2(E.t.)=0.51, R^2(P.o.)=0.61, R^2(P.p.1)=0.35, R^2(P.p.2)=0.68. Based on sum of galls per clone (mean of 2 years).	*E. testaceipes*	*Ph. oblita*	*P. proxima* 1st generation	*P. proxima* 2nd generation
Leaf morphology + size	-0.59*	-0.77***	-0.49*	-0.49**
Plant size + growth	-0.03	-0.05	0.32	0.51**
Foliation phenology	-0.02	0.16	0.42*	0.43*

Conclusion:

Relevance for host plant selectivities of *E. testaceipes* and *Ph. oblita*: higher attractiveness by stronger visual and mechano-sensoric signals due to larger, less pubescent leaves → preference for *S. fragilis.*

Relevance for host plant selectivity of *P. proxima*: sufficient resource supply by early leaf phenology in spring and resource limitation for the 2nd generation in summer → preference for *S.* x *rubens*.

A **Clone effect** leads to differences of gall densities of *P. proxima* between single clones within homogenous taxonomic host plant groups***.

Attractiveness of larger, less pubescent leaves	Additional relevance of early foliation	Additional relevance of plant size, height, growth, and vigor
Visual and mechano-sensoric signals	Resource availability in spring	Resource availability in summer

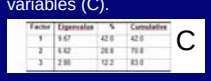
Further prospects:

→ Do general lower gall densities on *S. alba* clones lead to lower parasitation rates and therefore better offspring performance of *Pontania proxima*?

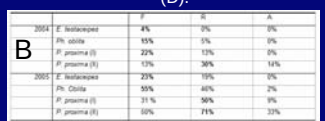
Methods:
Analyses were performed 19 clones belonging to the *S. alba/S. fragilis*-aggregate, representing a morphological continuum from typical *Salix alba* to typical *S. fragilis*, including intermediate forms. About 240 cuttings were planted on an experimental plot in the Ecological Botanical Garden of the University of Bayreuth (Germany).

Statistical analysis:
*: Based on K.-W. ANOVA concerning gall densities (galls per 1000 shoots) on plants (A) and frequency of affected plants per clone (B).

**: Factor analysis including 23 variables (C).

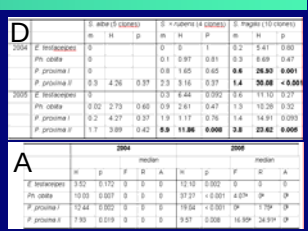


C



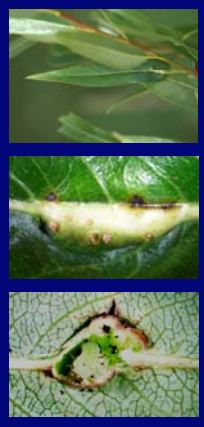
B

***: K.-W.-ANOVA concerning gall densities between single clones within taxonomic groups (D).



D

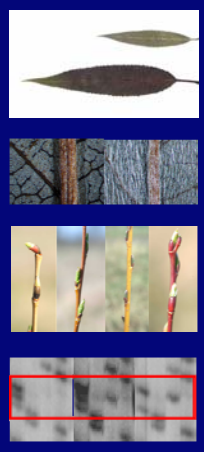
A



Euura testaceipes Brischke 1883

Phyllocolpa oblita Serville 1823

Pontania proxima Serville 1823



Salix alba L., *S.* x *rubens* Schrank, *S. fragilis* L.

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