**Cover letter for the manuscript** “**Linking modularity and conspicuous asymmetry in the insect head and mandibles” by S. Ginot, S. Sommerfeld & A. Blanke.**

Dear Editors,

We are pleased to submit the above-mentioned manuscript to *Evolution*. This study investigates whether morphological conspicuous asymmetries in bilaterian animals relate to modularity between the left and right sides. Indeed, conspicuously asymmetric structures can be viewed as a special case of phenotypic diversification, whereby each side of a bilaterally homologous structure displays a different phenotype. A frequently communicated idea is that modularity between an organism’s substructures favors evolutionary diversification by allowing these substructures to vary to some extent independently from each other. It may therefore be suggested that 1) left-right modularity allows conspicuous asymmetry to arise, and 2) modularity between neighboring symmetric and asymmetric structures is necessary to avoid negative disruption of the symmetrical body plan.

We test these expectations using the grasshopper head and mandibles as a model which is justified for several reasons: First, the insect head constitutes a so-called *tagma*, meaning an overall highly integrated anatomical unit, whose substructures are physically, and to some extent developmentally, correlated with each other. Furthermore, the head carries sensory organs, for which symmetry should be advantageous. On the other hand, the grasshopper head, like that of many other biting-chewing insects, also has a pair of mandibles which are conspicuously asymmetric, forming a “key-and-lock” morphology which allows them to cross and occlude. Both mandibles must therefore have divergent but highly constrained phenotypes to ensure proper feeding.

Our findings confirm variational modularity between the left and right mandibles, but also between the mandibles and the rest of the head underlining empirically that modularity is an important factor in the development of conspicuously asymmetric phenotypes. More generally, this particular case also brings additional support to the importance of modularity in phenotypic diversification.

We strongly believe that our study is a good fit for *Evolution*, as it brings up the novel idea of connecting conspicuous asymmetry with modularity, as well as unique empirical data to start tackling this idea. Additionally, our data allowed us to control the impact of various ways to superimpose data on integration and modularity results, which we hope can participate in solving ongoing methodological debates, by bringing in more empirical data.

On behalf of my co-authors, with best regards,

Samuel Ginot