FIRST PERSON

First person – Hamed Rajabi

First Person is a series of interviews with the first authors of a selection of papers published in Biology Open, helping early-career researchers promote themselves alongside their papers. Hamed Rajabi is first author on 'The probability of wing damage in the dragonfly *Sympetrum vulgatum* (Anisoptera: Libellulidae): a field study', published in BiO. Hamed is a PhD student in the Functional Morphology and Biomechanics Department at Kiel University, Germany, investigating the biomechanics of insect wings and cuticle, and the mechanical behaviour of biological structures.

What is your scientific background and the general focus of your lab?

I studied mechanical engineering during my undergraduate and graduate studies. However, my strong interest in the complexities of biological structures led me to move to Prof Gorb's research group at the Functional Morphology and Biomechanics Institute at Kiel University. Now, I'm supported by the federal state Schleswig-Holstein to conduct my PhD on the biomechanics of insect cuticle.

How would you explain the main findings of your paper to non-scientific family and friends?

We are aware that insect wings undergo numerous mechanical stresses during an insect's life time. These stresses, induced by either aerodynamic forces or mechanical collisions, may result in catastrophic wing damage. Results obtained from the detailed investigation of 119 wings of a dragonfly species, caught in the field, suggest that some wing regions might be adapted (more than other wing regions) to mitigate damage caused by excessive mechanical stresses. Looking at damage-mitigating mechanisms in dragonfly wings may help us to increase the lifetime of engineering structures, especially those working under dynamic loads.

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What are the potential implications of these results for your field of research?

The results of this study provide new insights into the structure–function relationship in dragonfly wings. The results are especially important for future studies focusing on damage tolerance characteristics in the wing. Such studies are extremely important in the development of new engineering materials with high damage resistance.

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What has surprised you the most while conducting your research?

Considering the distribution of the stiffness in insect wings and the nature of the forces applied to the wings in flight, we expected to see more damage at the wing base and leading edge. However, the very surprising results indicate a completely different phenomenon: the probability of wing damage was notably higher at the tip and trailing edge of the wings.

What, in your opinion, are some of the greatest achievements in your field and how has this influenced your research?

Owing to the pioneering studies of devoted researchers in this field, such as Wootton, Newman and Gorb, nowadays we know much more about the importance of the structure and material composition of Odonata wings in their flight performance. Such studies have opened a new field of research, which I am already working in.

What changes do you think could improve the professional lives of early career scientists?

One of the major problems facing early career researchers is the huge competition for the limited funding sources available in science. This has already caused many researchers to end their scientific careers. Providing more funding opportunities will definitely help those interested in science to more freely focus on their research.

What's next for you?

As a PhD student close to his defence, I am looking for financial support for my postdoc research. After my PhD, I would really like to focus on those cuticlar structures that seem to be highly specialized to perform a certain function.

References

Rajabi, H., Schroeter, V., Eshghi, S. and Gorb, S. N. (2017). The probability of wing damage in the dragonfly *Sympetrum vulgatum* (Anisoptera: Libellulidae): a field study. *Biol. Open* **6**, doi:10.1242/bio.027078.