



Plasticity and differential brain investment between a social parasite wasp and its host

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Brain plasticity has evolved across many animal taxa. Because production of brain tissue is energetically expensive, neuro-anatomical plasticity provides advantages in dynamic environments or variable social contexts. Therefore, differential investment in developing brain structures may depend on the function most needed in response to specific selective pressures. Here, we take advantage of the relationship between the social wasp *Polistes dominula* and its obligate social parasite, *Polistes sulcifer*. These two species are closely related and are in an evolutionary arms race in which the parasite needs to locate and invade the host nest, and, in turn, the host must recognize this intruder and defend its nest. We here explore investment in brain structures in these two species with distinct sensory needs. Our results show variation in brain orientation between the host and social parasite, which may be associated with the processing of different sensory information needed to find hosts or defend against parasites. We are also currently comparing their investment towards neural structures that receive and process visual and olfactory stimuli. Our work provides insights towards the role of sensory systems in influencing brain architecture in animals.