tracking such resources that are less ephemeral and therefore spatially more clumped (lower dispersion). Few studies have measured two or more dispersal traits simultaneously, have studied how they correlate with each other across community members, or have examined the influence of life-history traits in conjunction with resource dispersion within the context of a community (however, see [35] for amphibians).

A valuable model system within which questions about dispersal can be addressed in the context of resource dispersion, life-history strategies and community assemblage is the microcosm of the fig syconium, which is a globular enclosed inflorescence that hosts developing fig wasps. These communities are comprised of wasp species obligately dependent on a single host fig (*Ficus*) species [6, 36]. They consist of a pollinating and a set of non-pollinating wasp species that vary in their life-history traits and oviposition resources within the syconial microcosm [37, 38]. Female wasps oviposit into the syconium, where their offspring develop and mature into adults. Wingless males die after mating within syconia; winged females leave natal syconia and disperse to locate host plants with syconia suitable for oviposition. Tropical fig plants produce syconial crops year-round; they usually exhibit reproductive synchrony (all syconia exhibit the same ontogenetic stage) within plants [39]. Natal plants do not bear oviposition resources when adult females emerge and wasps thus leave their natal plants in search of suitable syconia for oviposition on other fig plants. Different wasp species utilize different niches within the syconium; the earliest arriving wasps use syconium wall tissues and undifferentiated flowers as egg deposition sites; wasps (such as the pollinator) that arrive at the pollen-receptive stage of the syconium oviposit into mature flowers and wasps that arrive after pollen receptivity are parasitoid wasps or inquilines on specific larval/pupal species within the syconium [38, 40]. Each wasp species oviposits into the syconium within a specific time period when the syconium is suitable as an oviposition resource; this is referred to as the oviposition window [37, 41] (Additional file 1: Figure S1). Shorter oviposition windows translate to a smaller proportion of plants bearing suitable syconia of the corresponding ontogenetic stage in a population (Fig. 1). This causes relatively increased oviposition-resource dispersion, which could increase the selection pressure for dispersal and decrease dispersal trait variances compared to longer windows. Therefore, the length of the oviposition window is an important dimension that can affect dispersal abilities. The fig system therefore provides excellent material for an interspecific study of fig-associated wasps— this is due to the differences between wasp species only in the ephemerality of the particular oviposition resources appropriate for each species on the same exploited fig species (Fig. 1).

The context for dispersal in such systems is clear: female fig wasps, after mating within the syconium, disperse to locate specific oviposition resources of different availabilities, offered by a single host species. While wind dispersal is believed to be important for fig wasps, they could be additionally propelling their dispersal through their own dispersal capacities [42–44]. However, there is no knowledge of the active flight capacities of a fig wasp community and their contribution to dispersal. Fig wasps also encounter high mortality during dispersal through predation and temperature/desiccation effects [44, 45]. Therefore, there is likely a high selection pressure for successful dispersal in fig wasp communities. Fig wasp community members also exhibit varying degrees of evolutionary relatedness, thereby allowing the comparative examination of dispersal traits within a phylogenetic context. Fig wasps therefore provide an excellent platform to understand the combined implications of the pace of life and ephemeral resource dispersion on dispersal abilities.

We asked the following questions in a fig wasp community:

1) Do fig wasp species that exhibit a "fast"-paced life-history strategy express traits associated with enhanced dispersal capacities (as shown by longer flight durations, higher somatic lipid content, and greater sRMR) compared to species with a "slow"-paced strategy?
2) Are dispersal capacities negatively related with resource availability in time, i.e. lengths of the oviposition window? Do dispersal trait variances relate positively with this resource availability?
3) How are trait correlations influenced when accounting for phylogenetic relatedness among species? Do dispersal traits exhibit a phylogenetic signal?

Methods

Study system

The fruiting phenology of the cluster fig *Ficus racemosa* shows little seasonality and trees exhibit high degrees of within-tree reproductive synchrony but population-level reproductive asynchrony throughout the year [46, 47]. Syconia of *Ficus racemosa* progress through several developmental stages: a) the pre-receptive phase, which constitutes the primordial stages of syconium development and the stages before pollen receptivity; b) the pollen-receptive stage, when pollinators enter syconia to pollinate flowers; c) the post-pollination stage, or the developmental stage when wasps and seeds develop in the syconia; d) the emergence phase, when adult winged female wasps disperse in search of oviposition sites; e) the fruit ripening stage when seeds are dispersed; and f) a gap phase when no syconia are present on the host plant [37] (Additional file 1: Figure S1). The life-history traits, oviposition resource availabilities, trophic position,