Stockoff (1993) uondumsuos poc s adults. Even as e important in

si bool flubs ne sproduction, and ongevity may be ərutəstunsm 23ə. -səqıufs tot squt it muscle may be ual resources can

tons of essential their symbionts mori ebice onim in reproduction. ttial amino acids carbon allocated ces, adult nectar rovisioning. After no acids in nectar s are synthesized the larval diet, Essential amino 889 odiooqs ni su tive to C4 plants,). C3 plants are r or cane sugar dults on sucrose larvae on grape isis (O'Brien et al. facture by a daye dietary sources 7). Stable isotopes ylətsibəmmi gare abelled as larvae, sessed by mating t adult life. Male to sevives of trast, nitrogen is stasittun gaizilic ference to stored

arbohydrate-rich, ult contributions.

ons, or included were painted on cose and amino

quality of their host plants, although this hypothesis reared gypsy moth larvae, Lymantria dispar Amino acids 2.0-Proportion of amino acid carbon 2.0 Latinassa-noV Essential ₽.0 9.0 8.0

,**ee** A2U ant to saneis2 to ymabesA lenoitaN Source: O'Brien et al. (2002). Proceedings of the Note: Data are for eggs laid on day 12, when stable isotopes.

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their exclusive origin in the larval diet. are within measurement error of zero, indicating O'Brien et al. 2000). All essential amino acids carbon isotopic composition has stabilized (see

flight-capable morphs in earlier studies). Flightless

(although this morph was not distinguished from

winged adults by histolysis of flight muscles

a second flightless morph is derived from long-

muscles and reduced lipid stores. In some species

morph has short wings, non-functional flight

lipid stores for flight fuel, while the flightless

fully developed, functional flight muscles and

and Denno 1997). The winged morph usually has

morphs are easily recognized (reviewed by Zera

continuous variation in flight capability, and wing

dispersal polymorphism because it involves dis-

distinguished (see Section 5.2.1 for discussion of

typic plasticity are sometimes not carefully

terms polymorphism, polyphenism, and pheno-

to the morphological differences. However, the

is often used when there is a genetic component

(Zera and Denno 1997). The term polymorphism

muscle during a critical period of development

which block the development of wings and flight

controlled by elevated titres of juvenile hormone

of genetic and environmental variation, and is

phism in crickets. This arises from a combination

for endocrine control comes from wing polymor-

physiology (Nijhout 1999), and the best evidence

are likely to be controlled by changes in endocrine

evidence (Müller et al. 2001). All insect polyphenisms

is only partially supported by the accumulated

terminology).

Wing polymorphism is a commonly studied

hawkmoth Amphion floridensis, measured using

derived from the adult diet in eggs of the Figure 2.16 Proportion of amino acid carbon winged aphids is a result of poor nutritional commonly accepted that the development of generations with different phenotypes, and it is butterflies. Aphids exhibit a complex sequence of the wet and dry seasonal phenotypes of some of development; as in the castes of social insects or environmental information during a critical phase irreversible changes in phenotype in response to Polyphenisms or developmental switches are Hight polymorphism

phylogenetic analysis showed no statistically

reduction in females, although Hunter's (1995)

Lymantriidae exhibit a high incidence of wing

forest Lepidoptera in the Geometridae and

plant environments (Miller 1996). Spring-feeding

reach outbreak densities in homogeneous food

with this type of life history that are most likely to

(Montgomery 1982). Incidentally, it is Lepidoptera

50 per cent of the nitrogen assimilated by the larvae

under laboratory conditions) which contain

Moths eclose with mature eggs (1300 per female

and there is no need to search for adult food plants.

female moths do not fly. Neither sex feeds as adults

male larvae. Males need lipid for flight fuel, but

shifted to one for high lipid content, especially in

that an initial preference for high protein content

differing access to two artificial diets, and found

(Lymantriidae) through several instars with

significant increase in fecundity.