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|  | **Definitions** | **Detected** | **Not detected** | **Useful References** |
| **Resource Trade-off** | Increased investment in one defence limits investment in another defence. | * Deploying (and losing) chemical defence fluid decreases its toxicity in future encounters with predators (Lindstedt et al., 2018) * Sequestration of defensive chemicals in milkweed bugs trades off with their synthesis *de novo* (Havlikova *et al.*, 2020) | * Reflexive bleeding ***did not*** affect elytral colour in ladybirds (Grill & Moore, 1998) | (Broom *et al.*, 2010) |
| Investment in defence limits investment in non-defensive trait (e.g., growth, development, securing a mate, thermoregulation, reproduction). | * Decreased population growth rate in defended algal clones relative to undefended clones, under resource limitation (Yoshida *et al.*, 2004) * Concave defence-growth trade-off in lake phytoplankton (Ehrlich *et al.*, 2020) * Reduction in tadpole growth rate in the presence of predators (Van Buskirk, 2000) * When resources are low, predator-induced morphological and behavioural responses primarily reduce tadpole survival. When resources are high, the cost of defence leads to reduced development rate and mass (Steiner, 2007) * Under threat of predation (kairomones from phantom midge), body size increases and neck spines grow in *Daphnia pulex*, but it takes longer to grow to maturity (Tollrian, 1995) * Defence against predators trades off with ability to defend against pathogens in the freshwater snails (Rigby & Jokela, 2000). * Increased allocation to defence against protozoan predation decreases the bacterial virulence (Friman *et al.*, 2009) and ability to use resources efficiently (Friman *et al.*, 2008) in *Serratia marcescens*. * Allocation to responsive defence decreases growth and reproduction in *Pieris brassicae* larvae (Higginson *et al.*, 2011). * Trade-off between the warning signal efficacy and mating success in aposematic polymorphic *Arctia plantaginis* males (Nokelainen *et al.*, 2012). * Environment mediated trade-off between body size and signal luminance in *Dendrobates auratus* (Flores *et al.*, 2013). * Sequestration of cardenolides from host-plants increases protection against predators but impairs growth and development in milkweed bugs (Petschenka *et al.*, 2022). | * Defended and undefended algal clones showed little difference in growth rates when resources were abundant (Yoshida *et al.*, 2004) * No tendency for a survival cost of responding to predators (Van Buskirk, 2000) * Development of large orange warning signal size does not incur life-history costs for aposematic *Arctia plantaginis* larvae (Lindstedt *et al.*, 2016). * Negative genetic trade-off between the concentration of defensive chemicals in defensive fluid and growth but not with the volume of fluid and growth (Holloway *et al.*, 1993). * No phenotypic correlations between the carotenoid pigmentation and performance indices in *Orqyia antiqua* (Sandre *et al.*, 2007). | (de Jong, 1993; Stamp, 2003; Ferrari *et al.*, 2009) |
| **Functional Trade-off** | Increased efficacy of one defence reduces the efficacy of (or need for) another defence. | * Bivalve shell shape optimized for faster, deeper burrowing to evade predators reduces crush resistance (Johnson, 2020) * Distance run from a predator negatively correlates with body armour in lizards (Losos *et al.*, 2002) * Defensive sting in ants is negatively correlated with spines, large eye size, and large colony size (Blanchard & Moreau, 2017) * Butterflyfish species with reduced morphological defences possess adaptations for quick escape, forage in familiar areas, and benefit from group vigilance arising from sociality (Hodge *et al.*, 2018) * Fleeing vs. tonic immobility in beetles. Fleeing increases distance from the threat, whereas tonic immobility reduces predator detection (Cardoso & dos Santos Mendonça, 2019) * In leaf beetles, dorsal spines increase risk of attack, but help prevent subjugation by tree frogs (Shinohara & Takami, 2020) * Motion dazzle vs. camouflage. When moving, striped targets are caught less often and missed more often than camouflaged targets. When stationary, striped targets are readily detected, and camouflaged targets are caught less often (Stevens *et al.*, 2011) * Aposematism vs. transparency in butterflies: some toxic butterflies have wing colour patterns combining conspicuous patches and large transparent areas. The existence of mimicry in those systems strongly suggests that those butterflies are aposematic. Transparency makes those butterflies less detectable by predators, but likely decreases the efficacy the whole aposematic/mimetic system (the effective encounter rate by predators is reduced). And obviously the presence of conspicuous elements in wing reduces the efficacy of concealment provided by transparency (Arias *et al.*, 2019; McClure *et al.*, 2019). (Note: this trade-off likely occurs for any other type of crypsis, too). * Due to negative genetic correlation across life-stages, investment in large and more effective warning signal in larval stage of wood tiger moth (*Arctia plantaginis*) trades off with efficient warning signal pigmentation in adult stage (Lindstedt *et al.*, 2016). |  |  |
| Defence phenotype increases efficacy against one predator, but reduces efficacy against another. | * Tail shape response in tadpoles exposed to one predator (fish vs. dragonfly nymph) increased risk to the other predator (Benard, 2006) * Spines protect dragonfly larvae from fish, but spined individuals experience higher predation by Aeshnidae dragonfly nymphs (Mikolajewski *et al.*, 2006) * Dorsal spines in leaf beetles were defensive against tree frogs, while explanate margins were defensive against assassin bug and crab spiders (Shinohara & Takami, 2020) * Behavioural response of roach to one predator (pike vs. perch) increases risk to the other predator (Eklöv & VanKooten, 2001) * Behavioural response of mayflies to one predator (stoneflies vs. fish) increases exposure to the other predator (Soluk & Collins, 1988; Soluk, 1993) * The chemical defences of insect herbivores are effective against generalist predators on average, but not effective against specialist predators and generalist parasitoids, and increases the risk of parasitism by specialist parasitoids (Zvereva & Kozlov, 2016). |  | (Sih *et al.*, 1998; Relyea, 2003) |
| Defensive phenotype interferes with non-defensive trait (e.g., mobility, thermoregulation). | * *Piper sp.* contain defensive compounds and experience a trade-off between seed dispersal and fruit defence (Whitehead *et al.*, 2016) * Predator-induced phenotype in tadpoles reduces predation, but increases mortality from other causes (Mccollum & Buskirk, 1996) * Red flour beetles with longer and more frequent tonic immobility have lower mating success (Nakayama & Miyatake, 2010) * Wing transparency in butterflies may reduce hydrophobicity (Perez Goodwyn *et al.*, 2009) * In mimetic butterflies resemblance in wing colour pattern can cause reproductive interference (individuals are attracted to heterospecific, co-mimetic individuals) (Mérot *et al.*, 2015) * Mimetic butterflies and their models experience aerodynamic costs because the slow angular velocity of their wings enhances the defensive colour signal (Srygley, 2004) * Investment in a more effective warning signal trades off with thermoregulation (Lindstedt *et al.*, 2009) | * No trade-off between predation resistance and competitive ability in *Culex* and *Aedes* mosquitos (Murrell & Juliano, 2013) |  |
| **Synergy** | **Two defensive traits that provide more protection when possessed (deployed) together than either separately.** | * Magnitude of functionally-independent behavioural and shape-based defences are positively correlated in snails exposed to crayfish (Dewitt *et al.*, 1999) * Positive correlation in the expression of functionally-independent morphological and behavioural defences in tadpoles exposed to predation risk (Hossie *et al.*, 2017) * Prey with ‘deimatic displays’ or flash behaviour, benefit from crypsis prior to attack (Kang *et al.*, 2017; Umbers *et al.*, 2017, 2019; Loeffler-Henry *et al.*, 2018) * Many prey combine morphology and behaviour to enhance mimetic fidelity (Penney *et al.*, 2014) * Aposematism and gregariousness ensure higher protection against predators (Mappes *et al.*, 1999; Gamberale-Stille, 2000; Riipi *et al.*, 2001, but see Sillén-Tullberg, 1990; Reader & Hochuli, 2003) * Unpalatability and escape capacities in butterflies may be advertised by the same signal (Pinheiro *et al.*, 2016) | * Eyespots and defensive posture both confer protection, but having both traits does not increase protection further (Hossie & Sherratt, 2013) * Hairiness together with the aposematic coloration did not increase defence efficacy against birds in *Arctia plantaginis* larvae (Lindstedt *et al.*, 2008) |  |
| **Multi-role traits** | **A defensive trait has additional functions (other than defence) that increase prey survival or reproduction (i.e., investment in defensive trait does ‘double duty’).** | * Dual function of anal fluid in the burying beetles in parental care and chemical defence (Lindstedt *et al.*, 2017) * Dual role of chemical defence in defence against predators and parasites in newts (Williams *et al.*, 2010; Calhoun *et al.*, 2017) * In *Heliconius erato*, the effectiveness of an aposematic signal was positively correlated with its effectiveness at inducing mating behaviour (Finkbeiner *et al.*, 2014) * Various defensive traits in mammals (e.g., thick loose skin, enlarged claws, enlarged teeth, cranial weaponry, venom) also have non-defensive functions (Stankowich *et al.*, 2011) * Pyrrolizidine alkaloids (PAs) collected from plants are used as precursor for both chemical defences and pheromones in Ithomiini butterflies. Defensive PAs are possibly part of nuptial gifts to females (Trigo, 2011). Similarly in *Utetheisa ornatrix* PAs are used in chemical defence, nuptial gifts, protection of eggs and production of pheromones (Eisner & Meinwald, 1995). * Exoproducts produced by *Pseudemonas* bacteria improve their competitiveness against other bacteria and increase protection against their predators (Jousset *et al.*, 2008, 2009). |  |  |

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