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mphibians have evolved a wide range of adaptations to
minimise the risk of predator attack, including aposematic
colouration. It is generally accepted that predators receive
advance warning of apparent toxicity when potential
prey items present bright and contrasting colours (Vitt &
Caldwell, 2014). This is in line with the hypothesis of venom
optimization (Wigger et al., 2002), according to which the
successful deterrence of a predator may not require the use
of venoms or poisons. These consist of hundreds of protein
and non-proteinaceous compounds, and their production
comes at a high metabolic cost. As a result, adaptations have
evolved to minimise toxin expenditure, for example by behav-
ioral control (Morgenstern & King, 2013).

A well-known way of displaying aposematic colouration
is the unken reflex, first described in amphibians of the
genus Bombina, but also demonstrated in other amphibians,
including newts and salamanders (Löhner, 1919 as cited
in Telea et al., 2021). This reflex involves arching the body,
presenting the undersides of the brightly coloured limbs and
partially exposing the ventral surface, while at the same
time remaining still and closing the eyes. In addition to the
full unken reflex, there may be a partial reflex, with markedly
less flexion. Then, the limbs are detached from the ground so
as to display the brightly coloured side, and the eyes are open. Both
Bombina bombina and Bombina variegata, are found in Poland
and both exhibit this reflex. Besides the unken reflex, Bombina
toads may also react to a threat by immobilising, running
away or inflating their bodies. The last of these reactions has
apparently not been reported previously in B. variegata and
has been suggested as a feature that distinguishes this species
from B. bombina (Bajger, 1980).

On 15 August 2008 in the village of Makowa (southern
Poland; GPS 49° 38'33.85" N, 22° 40'24.55" E), I approached a
B. variegata standing on the flat edge of a small puddle, near
the waterline of a shallow stream. As I approached the toad,
it first became motionless (this lasted for about 30 seconds),
then it jumped into the stream, at the same time turned
over on to its back and inflated its body (Fig. 1). It remained
perfectly still in this position for almost 5 minutes, after
which it deflated, returned to its 'normal' shape and calmly
moved away. The locality of this observation lies well to the
south of the known distribution of B. bombina thus the individual
observed must be B. variegata. The observation shows that, in
exceptional situations, B. variegata may use the antipredator
defensive strategy of flipping over and puffing up its body.
This makes it visually larger and more difficult for
predators to overpower and swallow. Also, the fact that the
bright colouration of Bombina covers the entire underparts
and not just the legs and body margins suggests that it plays
an important role in defensive behaviour.

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