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Leg 'cramp' and endoparasites

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The causes of leg 'cramp' in waders are not fully understood (*Wader Study Group Bull.* 24: 24; 27: 19–21; 28: 15–16). Stanyard (*Wader Study Group Bull.* 27: 19–21) reported that the three casualties out of 110 Curlews *Numenius arquata* caught were in a less advanced state of moult than the other birds and noted that 'this might indicate poorer condition'. However, Purchase and Minton (*Wader Study Group Bull.* 34: 24–26) found that female Bar-tailed Godwits *Limosa lapponica* with much subcutaneous fat (i.e. in 'good' condition) seemed more likely to suffer from 'cramp' than males or juveniles.

During the winter of 1980/81, a total of 256 Redshanks *Tringa totanus* were caught at night in mist nets in central Thailand. Of these, nine suffered from 'cramp', despite being placed in tall keeping boxes (*Wader Study Group Bull.* 20: 21–24) after capture, and were killed. A further four apparently healthy birds were also collected (two caught by the author and two from local bird nets. Of the latter, one was found freshly dead, and the other alive but with a dislocated leg). All specimens were prepared as museum skins. Brief examination of the carcasses revealed that five of the nine 'cramp' victims had some endoparasites (nematodes, cestodes, trematodes), and in several cases the burdens were heavy. None of the four healthy birds showed signs of endoparasite infections. (All parasites are awaiting identification). It is therefore possible that waders with endoparasite burdens and so possibly in poor condition, may be more liable to 'cramp' than waders in better condition. To further examine the possibility of a link between endoparasite burden and leg 'cramp', it would be useful if those people with access to 'cramp' victims examine them for endoparasites as well as determining general body condition.

Valium against leg cramp in waders

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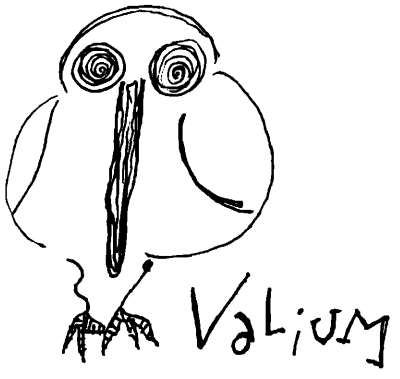
On five different occasions Knots *Calidris canutus* and Oystercatchers *Haematopus ostralegus* suffering from leg cramp were successfully treated with valium (diazepam). They recovered, in several cases after a period of deep sleep. Although valium was applied on only two wader species, we suspect that it may generally be applicable. We suggest that valium-tablets (of e.g. 1 mg) are henceforth at hand during catching operations to try to treat any victims of leg cramp.

It is incredibly annoying when a successful catch of waders ends in a partial disaster with several birds showing leg cramp, fluttering over the ground, unable to walk and to take off. It mostly occurs in large and long-legged wader species (Green 1978), and under conditions of thermal stress (Purchase & Minton 1982, pers. obs.). No wonder that wader workers have discussed this problem for years (Bainbridge 1975, Green 1978, 1980, Stanyard 1979, Minton 1980, Minton & Purchase 1982, Melville 1982).

Physiological studies indicate that leg cramp, or myopathy, is indicative of muscle fibre damage and enzyme leakage into the blood, e.g. caused by an impaired blood supply (van Heerden 1977, Henschel & Louw 1978). People have sought to prevent the problem by building appropriate keeping cages (Bainbridge 1975, Stanyard 1979) or to rescue waders fallen victim to leg cramp by massaging their leg muscles (Stanyard 1979, and ourselves). Attempts to save cramped birds by suspending them in a sling with the stressed legs dangling, in a quiet room until the birds are able to walk again, is labour-intensive and has met with variable, but generally little success (Green 1978, N. Clark pers. comm, pers. obs.).

Several times we had leg-cramped waders during our catching activities on the Banc d'Arguin, Mauritania (Ens *et al.* 1989, 1990). One day, somebody (most probably Jaap de Vlas) suggested to use valium (diazepam) to alleviate the birds' problems, since valium is a well known psychopharmaceutical used to treat muscle spasms and cramp in humans. In this note we report on the use of valium under field and laboratory conditions in helping relieve waders of their leg cramp.

During fieldwork on the Banc d'Arguin, on 5 and 6 March 1986, we mist-netted respectively 3 and 9 Knots *Calidris canutus* which were subsequently kept in outdoor aviaries for feeding balance studies. On 7 March one of the first catch developed leg cramp. At first, we suspended this bird in a sling, but this failed to bring relief. After the suggestion of using valium, we suspended a human valium tablet of 5 mg in water, mixed it with minced food pellets and administered this soft wet mass with the syringe to the bird. The next day this Knot appeared to be in perfect condition and it remained so afterwards. On 9 March, after handling the birds for a while, another Knot developed leg cramp. This bird was also given valium in the same way as previously and again it recovered overnight.



Again on the Banc d'Arguin, in later October 1988, an Oystercatcher *Haematopus ostralegus* was found more dead than dying in a mistnet. Back at basecamp in the early morning it was still breathing and was given a calm and cool place to revive. However, for the rest of the day it remained pretty much "unconscious". In the evening it was given parts of a 5 mg valium tablet dissolved in *c.*30 ml of water and mixed with minced food pallets, applied as previously to the Knots. It was sitting up on its belly within 1.5 hr and was standing upright after another hour. The next morning the Oystercatcher was released, after which it immediately started foraging in the tideline.

On the night of 17 January 1991 ten Knots were captured at Langebaan Lagoon, South Africa by L.G. Underhill and co-workers, put in a dark but well ventilated keeping box, taken back by car to Cape Town and immediately flown to Amsterdam, The Netherlands, where they arrived 24 hrs after their being caught. The birds were then carried to Texel, where they were released in a large indoor cage at room temperature with running fresh and salt water. Most birds looked perfect, but one showed signs of leg cramp, being unable to stand for long. Later that day a second bird showed the same problems while the first could not stand on its legs any longer at all.

Inspired by the Mauritanian pharmaceutical experience, the local chemist was visited and some human valium pills (2 mg), were obtained. Although humans can safely ingest a maximum of 1 mg/kg body mass (van Rossem 1989), it was decided that Knots of 120 g, with their typical high wader metabolism, would be able to endure half a pill, i.e. 1 mg. The two birds were force-fed half a pill, some 0.5 ml water and a Trouvit-(protein rich) food pellet. They sunk into a deep sleep in minutes, looking as though they would never wake up again. However, next morning, some 11 hrs after the treatment, they were happily standing or walking around in their cage! More than a day later, one of the treated birds showed signs of cramp again and was given another half-pill (1 mg valium). It again sunk into deep sleep for at least an hour, from which it was hardly possible to disturb it, and was walking around the following morning.

Sleep did not occur in the birds treated with valium in Mauritania. This may be due to the probable lower doses of valium (in view of the mixing with water and food before injection in the bird's oesophagus) applied there.

Earlier evidence accumulated by Purchase & Minton (1982) suggested that capture stress may sometimes affect birds long after their release. Such birds, in their case heavy, premigrant, female Bar-tailed Godwits *Limosa lapponica*, were found being unable to walk or fly, several km away from the site of release and several day later. The Knots which remained under observation in captivity after their treatment, remained healthy and apparently fairly happy, which suggests that valium inflicts no long-term negative effects. However, we do not know, of course, the effects of valium on orientation in birds which are about to depart on long-distance migrations.

Our observations show that valium might provide a powerful medicament to solve the problem of leg cramp in captured wild waders. We suggest that waders between 20 and 90 g be treated with 0.25–0.5 mg, and larger species with 1 mg. The birds have to be kept safe from predators and disturbance, in a warm, but not a hot, place and in the dark during their period of sleep. They should usually be ready for release in 10–12 hours. It would be advisable to give the

birds fresh water to drink before release. Note that valium is not freely available on the market in all countries (no longer in the Netherlands, for instance), but a deal should easily be made with either your personal medical doctor or veterinarian. Note also that in some countries a licence for using valium on captured birds, issued by the appropriate administration, would be required (as in the UK).

We suggest that some further trials with valium, perhaps under more controlled conditions and with veterinary guidance, should be carried out. As part of this process of validation, valium could provisionally become part of the routine-equipment of (some) wader ringers and we look forward to hearing about future experiences elsewhere.

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Stress myopathy in captured waders

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Introduction

An ancillary objective of the 1988 N.W. Australia Wader Expedition was to examine the factors which contribute to stress myopathy in waders caught for banding and to determine optimum procedures for minimising the problem.

Observations

Some signs of stress myopathy were observed in most of the catches containing large waders out of the 13 cannon net (5,852 birds) and 4 mist net (774 birds) catches made at Broome, 80 Mile Beach and Port Headland saltworks between 19 March and 9 April.

This was only in a mild form apart from 15 birds in 3 catches (mist net: 19 March, 210 birds in a night; cannon nets: 24, 29 March, 559 and 457 birds) which showed severe symptoms of stress myopathy. Three Red-necked Avocet died (out of a mist net catch of 27). Of the 12 Bar-tailed Godwits *Limosa lapponica* severely affected (3 out of 25, 6 out of 196 and 3 out of 44), some may have died or been preyed on and three from a cannon net catch were seen two days after the catch but were unable to fly.

The procedures adopted for banding and, particularly, for release (detailed below), are considered to have contributed significantly to the amelioration of the problem and the quick recovery of birds temporarily showing some signs of stress myopathy.

Factors contributing to stress myopathy

1. Bigger birds are generally most affected, especially if they have long legs. 'Worst' species (in decreasing order of severity) are Bar-tailed Godwit *Limosa lapponica*, Red-necked Avocet *Recurvirostra novaehollandiae*, Great Knot *Calidris tenuirostris* and Red Knot *Calidris canutus*. Broad-billed Sandpipers *Limicola falcinellus*, which had previously been though to be a problem, showed no signs this time. Eastern Curlew *Numenius madagascariensis* are known, from banding in Victoria, to be a problem – probably worse than Bar-tailed Godwits.

2. Birds with large pre-migratory fat deposits are more affected. However, very thin birds are also susceptible.

3. Mist netting causes proportionately more problems than cannon netting. For example, no problem has been experienced with cannon netted Red-necked Avocets in Victoria.

4. The longer the bird is struggling uncovered in a net, the more likely the occurrence of stress myopathy. This probably accounts for the differences observed between mist netting and cannon netting.