

# The Purple Gallinule in the *marismas* of the Guadalquivir

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*Plates 37-40*

Among the birds of Europe one species, the Purple Gallinule *Porphyrio porphyrio*, attracts the eye by the brilliance of its plumage and at the same time shocks it through its grotesque shape: it seems to be both an intruder from the tropics and a relic from prehistory. Three times the bulk of the Moorhen *Gallinula chloropus*, its plumage a silky purple-blue with metallic reflections, save for the white undertail, this monster sports an enormous, bright red, triangular bill, red frontal shield and eyes, and gnarled feet with disproportionately long toes as glowing red as the bill (plate 37).

## DISTRIBUTION

The genus *Porphyrio* ranges over the Old World in four basic types of coloration. The nominate form, entirely violet, is endemic to the western Mediterranean region; and the *madagascariensis* group of tropical Africa, Madagascar and Egypt has a green back contrasting with blue remiges and underbody. The *poliocephalus* group, from Turkey to Indo-China, is light blue with the head pale grey; this passes, in Malaysia, into the *melanotus* group of very pigmented forms, the head and back becoming almost black, across the Australasian region. Vaurie (1965) and some other workers have united them all in one superspecies but, taking into account the remarkable isolation around the Mediterranean between *porphyrio* of the western basin, *aegyptiacus* (in the *madagascariensis* group) of Egypt and *seistanicus* (in the *poliocephalus* group) of Asia Minor, I prefer to follow Peters (1934) in regarding these groups as separate species. Whatever subtle arrangements are proposed, all authors agree in recognising the distinctness of the violet Purple Gallinule of the western Mediterranean. The present distribution of this form is extremely limited: a few favourable sites in northern Morocco, Algeria and Tunisia; the *marismas* of the Guadalquivir in Andalusia; and the marshes of Sardinia (Mocci Demartis 1973). In recent decades the species has been noted in the Rharb and lower Lucus (Morocco), in large numbers at Lake Fetzara (Algeria), and on Lakes Ischkeul and Kelbia (Tunisia), as well as in south-west Spain as far as Valencia, but it has become very rare with draining. It has probably disappeared recently from Sicily, and longer since from southern Portugal. It certainly occupied the Camargue in southern

France in recent times, where it was seen in 1969 (Hovette 1972), and likewise the west coast of Italy.

#### HABITAT IN ANDALUSIA

My observations took place in the *marismas* of the Guadalquivir during 1962-65. This region, famous among ornithologists, has been described in detail by Mountfort (1958) and Valverde (1958). It consists of an immense stretch of alluvia accumulated by the River Guadalquivir, 'Father of Andalusia', against an arrowhead of littoral sand dunes which it meets at its mouth. These marshes are, or rather were, a vast, level mosaic of beds of rushes *Scirpus* and sedges *Carex* subjected to strong drying out in summer; small natural channels overgrown with reedmace *Typha* and reed *Phragmites* drain the ground but, at the edge of the dunes, a series of deeper lagoons normally holds water permanently.

In such conditions the Purple Gallinule has developed a particularly well-adapted biological cycle. As soon as the marsh, which has been baked dry by the Andalusian summer sun, is returned to water by storms and the flooding of the Guadalquivir, normally at the end of the autumn, it settles in and begins to nest even before the vegetation has completely regrown. Hardly are the young capable of flight when the mud dries out and the *Scirpus* begins to die; the birds then take refuge in the *Typha* beds (plate 40a) where water lies stagnant longer, and later they must withdraw as far as the littoral lagoons to spend the rest of the summer and autumn until the marsh is flooded anew. Such are the stages in the annual cycle of the Purple Gallinule in the *marismas*.

#### REPRODUCTION

Elsewhere in the Mediterranean region, the beginning of laying extends from the end of March up to June (Heim de Balsac and Mayaud 1962). In the *marismas*, however, clutches as late as this would not allow the young to become independent before the marshes dry out. In fact, of the five nests which I found on 15th April 1965, three had already been vacated by the young and the other two contained hatched clutches. With an incubation period of about 25 days, this indicates that laying was completed before 20th March; according to wardens it may begin in February or even January, with the first normal hatchings at the end of March. Replacement clutches and perhaps even normal second clutches are not out of the question. The speed of development of the chick is not known, but it seems quite slow and it is probable that *all* clutches are normally completed by April (though see pages 232-233).

It would be very interesting to relate the reproductive timetable of the Purple Gallinule in the *marismas* to variations in the water

cycle. In certain years water levels are low in the *Carex-Scirpus* beds at the beginning of spring; the thousands of ducks, rails, crakes, waders, gulls and terns which usually nest there at that time do not do so, and summer visitors such as Black-winged Stilts *Himantopus himantopus* and Collared Pratincoles *Glareola pratincola*, which normally settle in thousands, search farther north for more favourable sites. The intense evaporation rapidly dries out the open marsh before the chicks have had time to become independent. In such years few species but the Purple Gallinule breed, and the latter is successful (with local exceptions) because of its early laying and the refuge provided by the denser *Typha* clumps where the chicks hide.

The nest of the Purple Gallinule is an enormous construction, concealed in the clumps of *Typha* or the densest beds of *Scirpus*. It is very easy to find if one moves about on horseback (which is, besides, the only practical means of locomotion in this marsh), for one then looks down on the tall *Typha* and *Phragmites*; what is more, one is put on the trail by the presence near the nest of a wide, floating carpet of fresh *Scirpus* cut off level with the water by the Purple Gallinules, which chew the pith and use the stems for nest construction. In a few hundred metres I have rapidly found five nests in this way and it is tempting to speak, following numerous authors, of a loose colony; in fact, the high density in such places is due to the localisation of the dense stands of *Typha* and *Phragmites*. One large stand of *Typha* held two nests at opposite ends while many isolated clumps were not occupied, leaving a regular spacing between each nest. The nest is a pile of dead *Typha* stalks supported on the bottom and initially emerging only a few centimetres above the water surface; the eggs are laid in the cup of dry stalks. Each nest possesses one or sometimes two access ramps, made from a bundle of fresh *Scirpus*.

The eggs (plate 40b) resemble those of the Coot *Fulica atra* but are larger and more brightly coloured, with underlying blotches of pale violet and superficial ones of bright maroon; the ground colour is usually more solid, but of the clutch of six shown in plate 40b one egg was distinctly faded and another slightly. The chick on hatching is covered in long black down; its bright pink feet and toes, with black nails, are already enormous; the bill, also remarkably strong for a chick, is lead-grey with the base and nostrils blood-red and a white egg-tooth. A large chick, almost the size of a fully grown Coot but still incapable of flight, was caught by hand on 2nd August 1964 (plate 37b). Although we have no standards for estimating its age, it indicates an abnormally late clutch made possible by the very long flooding period of the marsh that year but nevertheless very delayed behind other clutches, since all the other

immatures I observed at that time could fly and had the build of adults. This bird shows that the first plumage following the neoptile down already has the pigmentation of immatures, dark matt blue above and light greyish below, and that the legs and feet, red from the outset, grow rapidly to allow a fast run before the wings have grown; the bill and frontal shield, still growing, are lead-blue. I have been able to recognise several stages of immature pigmentation, which I suspect correspond only to subtle variations of the first plumage but which have enabled me to make local censuses. The red of the rhamphotheca starts at the frontal shield where at first it forms an edging, gradually reaching the tip of the bill by August. Body moult is noted from October. I suspect that immatures resemble adults before the end of their first year.

#### VOICE

At the time of my observations nothing was known of the voice of the Purple Gallinule but the alarm cry, emitted sometimes when taking flight and vaguely described as like a blast on a trumpet. The vocal repertoire is, however, extremely rich and varied, but it is uttered from cover, often at night and during occasional short periods of excitement, especially in April. I made the first recordings of 'song' in 1965 and Roché (1966) completed them the following year. One vocal emission consists of a wailing which has something in common with that of the Water Rail *Rallus aquaticus*: it is a long, unbroken series of powerful but very plaintive rattles, without preamble and reaching a crescendo, the veritably human tone of which is striking. This is emitted at the end of the afternoon and at dusk by an isolated bird and plays, it seems, the rôle of a song. Other calls are, on the contrary, short and sharp, like brief blasts on a whistle, but all kinds of variations may be heard: brief gruntings, horn and trumpet blasts, and sounds like the ringing of a small bell which become gradually sharper and more nervous-sounding until their tone is more like the trumpet blasts. This repertoire of calls is emitted at night in chorus and increases in intensity as excitement grows.

#### FEEDING BEHAVIOUR

Nowadays it is well known that Purple Gallinules feed on vegetation and sometimes animal matter and that they use their feet as gripping devices (Glutz von Blotzheim *et al.* 1973). My original observations give several precise details. In August, when the *Scirpus* beds are dry, the Purple Gallinules, especially juveniles, gather in the *Typha* jungle of the channels which are still wet; these dense bands of reedmace are bordered by a bare, muddy beach which one can easily watch over hidden in one of the clumps of rushes *Juncus* which

border the dry *Scirpus* marsh. The Purple Gallinule seeks its food on foot and, by preference, when it feels it is safe, walks along the mud beach. Food items are seized first in one foot, more often the right foot; the basic diet is pith extracted from fragments of *Scirpus* and especially from shoots, as well as rhizomes, of *Typha*. These vegetable fragments are grasped between the toes, which are clenched a little, and lifted up halfway (with tarso-metatarsus held horizontally) towards the bill; if they fall to the ground they are picked up again with the foot and not the bill, even if the efforts to grip them turn out to be in vain. Pieces which cannot be grasped between the toes, such as rhizomes, are held by a foot while being torn with the bill.

The impact of the Purple Gallinules on the *Typha* appears to be very important, sometimes with signs of spectacular uprooting, to the point that I have wondered whether they were not risking destroying their own habitat. The regenerative power of *Typha* makes this improbable, but the birds are certainly containing the spread of the *Typha* and playing a part in maintaining the borders and openings which favour their movements in this jungle.

The animal part of the diet is improperly known but substantial, including many dead fish taken from small pools that are drying out. This was well illustrated by the following experience I had in the *marismas*. A semi-automatic camera was baited with a Mullet *Mugil sp* about 30 centimetres long, freshly killed. The Purple Gallinules which passed nearby, walking slowly along the reed-bed in search of food, were immediately interested, and several different individuals approached in turn throughout that day and the next (plates 38-39). Each feeding bird remained wary and took its time to eat small beakfuls of flesh: one foot was quickly placed on the fish, then the branchiae under the gill cover were attacked with the bill; later the pectoral fin was torn off to reach the flesh. At the beginning one bird, made uneasy by the noise of the camera shutter, seized the fish by the tail with its bill, tore it up from the mud and, despite its weight, ran off with it swinging to and fro between its feet; I had to rush out from my hide to make it abandon my bait. (The formidable strength of the bill can also leave smarting marks on the ringer.) The feet continued to play a rôle in this feeding behaviour, though they quickly became slimed over through trampling in soft mud. As always in birds, behaviour patterns are stereotyped and their vain repetition becomes comical: this was the case when one individual was trying to pick up, between its toes, a piece of flesh hanging from its bill which could not be seized like a stiff reed stem.

#### MOVEMENTS

The Purple Gallinule is very much a stay-at-home bird. During

uninterrupted observations I have recognised some individuals coming and going along a course of only a few tens of metres for several days on end. In the evenings the birds settle down in small groups in the reeds, which they clutch with their toes and where they spend the night safe from terrestrial predators. In the morning they are slow to resume daytime activities and sometimes allow themselves to be closely approached. Sun-baths are appreciated in the middle of the day.

Though reputed to be sedentary, in the *marismas* the Purple Gallinule makes cyclic seasonal movements. The most typical occurs after breeding, when the *Typha* beds to which the birds have retreated in turn begin to dry out; late, unfledged young have already rejoined the adults at the residual waterholes; now there is a general exodus towards the coastal lagoons and, no doubt, to the arms of the river. These movements take place at night over open ground—cracked marsh and sparsely vegetated grassland—and observations indicate that they are made entirely on foot: the Purple Gallinule could thus be classed as a pedestrian migrant! Even when disturbed on open ground it is loath to fly but runs very fast. On the deep lagoons where it awaits the re-flooding of the marsh, it does not swim out in the open; if it has to move away quickly it flies heavily, dropping feet-first into the first thick reed-bed it finds.

#### PROTECTION

Through its robustness, its secretive nature, its wide-ranging diet and its adaptable biological cycle, the Purple Gallinule seems destined for a good future. Not only does history show us the contrary but present-day circumstances render its survival more and more precarious. Certainly the species was, at the time of my studies, very abundant in the *marismas*, but I saw it also to be very vulnerable to predation, despite appearances. Its flesh is highly esteemed by man and it is the easiest bird to catch, even by hand, with a little patience: some workmen came to repair a dyke near the site of my observations, and on the following day I found traces of a small fire beside a pile of Purple Gallinule feathers! The semi-domesticated pigs being released in ever larger numbers on the marsh to fatten up must often be doing so to the detriment of the Purple Gallinules. The *Typha* is a flourishing plant but demands precise conditions of flooding. It is no secret that the *marismas* are plundered, while the Coto Doñana reserve itself includes only a small proportion of the marshes, very insufficient for the maintenance of aquatic fauna. Reintroduction in the Camargue seems to me very feasible and might be a success; otherwise one of the most extraordinary birds of Europe may even now be heading fast towards extinction.

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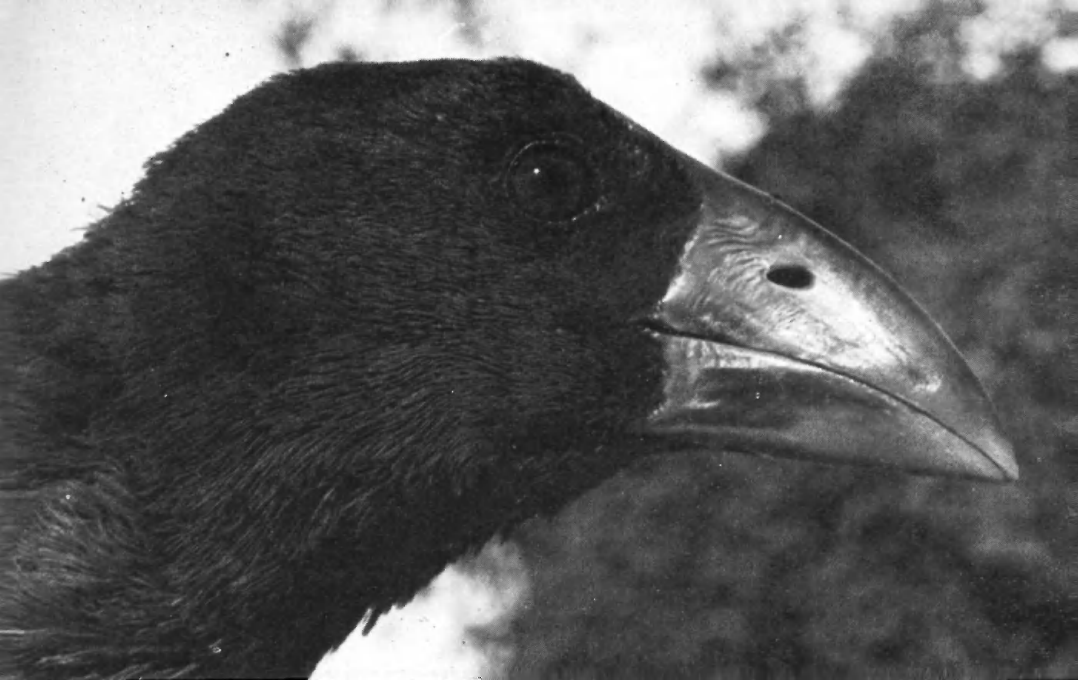


PLATE 37. Young Purple Gallinules *Porphyrio porphyrio*, Spain, 1964 (photos: Jacques Vielliard). Above, immature, October: the bill by this time is red, like the irides. Below, very late juvenile incapable of flight, caught by hand, August: matt dark blue above, bright greyish below, bill and frontal shield (both still growing) lead-blue, huge feet and toes red from the start (pages 230-236)







PLATE 38. Immature Purple Gallinule *Porphyrio porphyrio* coming at dawn to fish bait, Spain, August 1964 (photos: Jacques Vielliard). These two photographs and those opposite show different attitudes of the same individual (page 234). Below, note well-developed red frontal shield; bill, eyes and legs are also red





PLATE 39. Purple Gallinule pecking at dead fish and walking away; the long toes are buried in the soft, sticky mud. Note white undertail-coverts. Basic diet is pith extracted by the birds from *Scirpus* fragments and *Typha* shoots and rhizomes, but animal matter is also taken. The plant in the background is *Typha*





PLATE 40. Typical post-breeding season habitat of Purple Gallinules *Porphyrio porphyrio* in marismas of Guadalquivir, Spain, August 1964, showing bare, muddy patches from which the last remaining pools are evaporating, and a thick bed of *Typha*. Below, clutch of six well-incubated eggs laid in huge nest made of dry fragments of *Typha*, April 1965 (pages 231-232) (photos: Jacques Vielliard)

