

Recognizable Forms

Morphs of the Parasitic Jaeger

by

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Introduction

Parasitic Jaegers (*Stercorarius parasiticus*) are seagoing pirates during the nonbreeding season, making their living by robbing gulls, terns and other seabirds by forcing them to disgorge or drop their prey. Seeing a Parasitic Jaeger accelerating Peregrine-like, swiftly pursuing a tern until it drops its fish, then catching the fish in mid-air before it strikes the water, is an unforgettable sight. On their tundra breeding grounds, they also prey on small birds, eggs and young birds, lemmings, and invertebrates such as insects and spiders. Skuas and jaegers, subfamily Stercorariinae, are unique among birds in having the combination of strong, sharply hooked claws and fully webbed feet.

In Canada, the Parasitic Jaeger breeds in the Arctic south to northern Ontario (Godfrey 1986). It is a "rare summer resident along the Hudson Bay coast" of Ontario (James 1991). The Parasitic Jaeger is a rare to locally uncommon migrant in southern Ontario, mainly in the fall on the Great Lakes from late August to mid-November. Two of the best places to see jaegers in southern Ontario are Lake Ontario from Van Wagner's Beach at Hamilton during east or northeast winds, and Lake Huron at Sarnia during north or northwest winds. Directions to Van Wagner's Beach and Sarnia are in

Goodwin (1995), and there is an excellent site guide to seeing jaegers at Sarnia in *OFO NEWS* (Rupert 1995). Parasitic Jaegers are casual in spring in southern Ontario.

Adult Parasitic Jaegers are variable in appearance, but generally occur in three colour morphs (phases): light, intermediate and dark. See Figure 1. Our classification of adult morphs is based on the descriptions in the genetic studies of O'Donald (1983) and O'Donald *in* Cooke and Buckley (1987). Juvenile morphs are also variable in appearance; see the light, intermediate and dark morph juveniles illustrated in Figure 2.

In this article, we discuss the distinguishing features, frequency and distribution, and genetics of the three morphs of the Parasitic Jaeger in Ontario. Discussion is restricted to adults in breeding plumage and juveniles because these are the two age classes normally seen in Ontario. The best references on the identification of all three jaeger species are Olsen (1989), Kaufman (1990), Harrison (1983), Cramp (1983) and Harris et al. (1989).

Taxonomy

No subspecies (races) of the Parasitic Jaeger are recognized because differences between populations are slight. However, there is a marked geographical variation in the

frequency of the morphs between populations. For example, in Canada the dark morph makes up about 40 per cent of the breeding population in Labrador and less than one per cent in the Canadian High Arctic (Cramp 1983). See the discussion on the distribution and frequency of the morphs under Morph Genetics.

Plumage, Molts, Ages and Sexes

Sexes are alike in all plumages. Almost all birds seen in Ontario are in juvenile (juvinal) or adult breeding (definitive alternate) plumage. Jaegers molt twice a year. The postjuvenile (first prebasic), postbreeding (second and later prebasic) and prebreeding (prealternate) molts take place mainly on the oceanic wintering grounds far south of Ontario (Cramp 1983). Some very limited postbreeding molt (scattered pin feathers) begins on the breeding grounds (Parmelee et al. 1967). Parasitic Jaegers molt their pair of central tail feathers only once a year, during the complete postbreeding molt. However, the other two jaeger species molt their central tail feathers twice a year, replacing them in the postbreeding molt and again during the partial prebreeding molt (Cramp 1983). Olsen's (1989) statement that all three jaeger species molt their central tail feathers twice a year is questionable regarding the Parasitic Jaeger. Like large gulls, Parasitic Jaegers probably attain their first adult breeding plumage at four years of age (Todd 1963, Cramp 1983). Other ages between juvenile and adult breeding plumages are normally not seen in Ontario because most Parasitic Jaegers spend at least their first two years at sea (Cramp 1983). Subadult birds, probably in second summer

plumage, are casual in southern Ontario in late spring. As well, there is a subadult (exact age not reported) in the Buffalo Museum of Science that was collected by Harold Axtell on 26 November 1960 at Fort Erie, Niagara (Beardslee and Mitchell 1965). See the illustration of a light morph subadult on page 143 of the National Geographic Guide (Scott 1987). Third summer birds are essentially like adults, but at close range show some barring on the wing linings and have shorter tail projections. For a full discussion of plumages, see Cramp (1983).

Morph Genetics

O'Donald *in* Cooke and Buckley (1987) provided strong evidence that the three morphs of adult Parasitic Jaegers are under the control of a single gene. This gene has two alleles (forms), one for light coloration and one for dark coloration. Light morph birds have two alleles for light coloration, inheriting one light allele from each parent. Similarly, dark morph birds inherit two dark alleles. Intermediate morph birds have one light allele and one dark allele. The allele for dark coloration is incompletely dominant over the allele for light coloration. Therefore, most intermediate morph birds (heterozygotes) are more like dark birds in appearance. Compare the intermediate and dark morph birds in Figure 1. A similar situation occurs in the Snow Goose where most intermediate morph birds (heterozygotes) are closer in appearance to blue morph than white morph birds (Pittaway 1992).

A pure dark bird mated to a pure light bird should produce only intermediate morphs. A pair

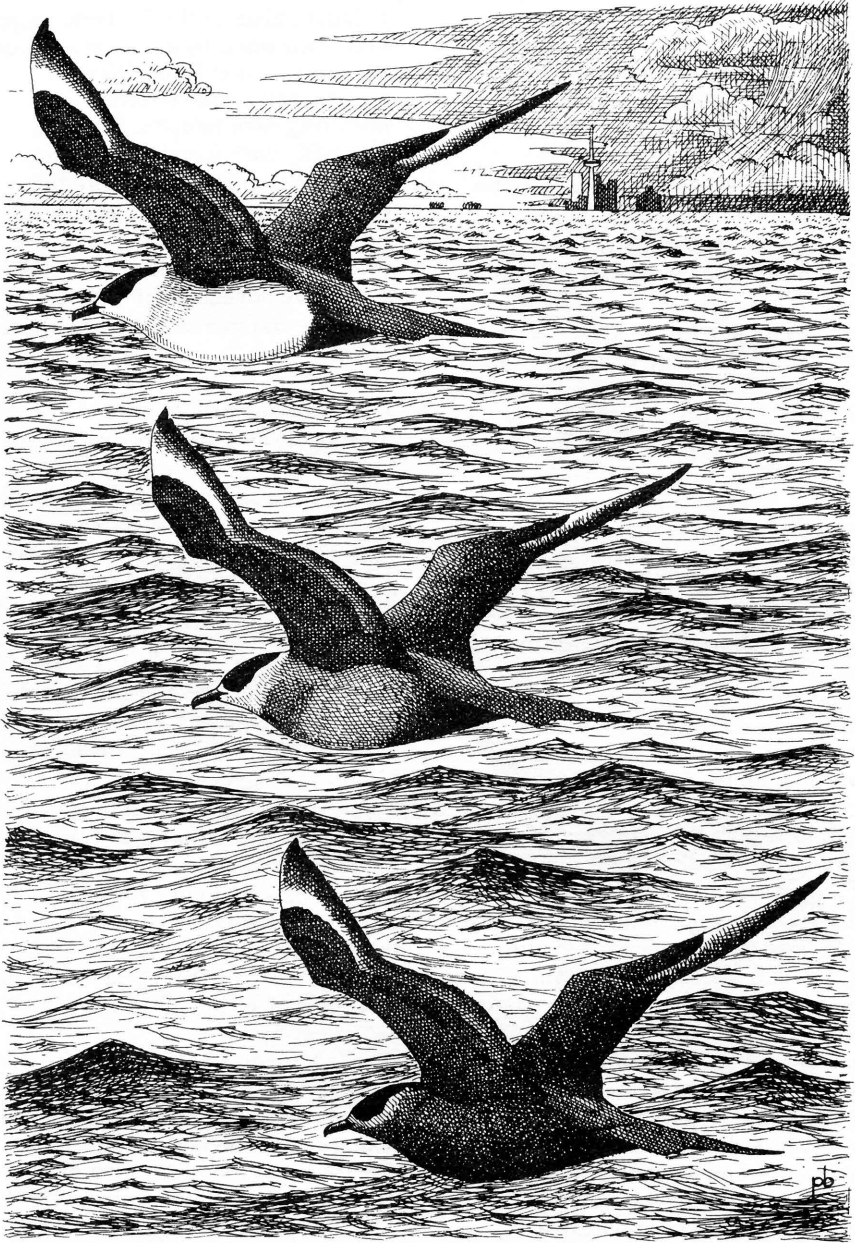


Figure 1: Adult Parasitic Jaegers: light morph (top), intermediate morph (middle), and dark morph (bottom) at Van Wagner's Beach, Hamilton. Drawing by *Peter Burke*.

comprising a dark and an intermediate morph should produce only dark and intermediate morphs in a ratio of one dark to one intermediate. Similarly, a pair of light and intermediate birds should produce only light and intermediate morphs in a ratio of one to one.

Genetic studies by O'Donald *in* Cooke and Buckley (1987) indicate that all light morph adults are homozygous (pure), whereas the darkest intermediate birds often are homozygous, and some dark morph birds are heterozygous (alleles for both dark and light coloration). As well, colour changes between the darkest intermediates and dark morphs "occur from one breeding season to the next", showing that morph coloration is "partly developmental in origin".

The frequency of the dark morph varies between populations and shows an interesting pattern. Generally, dark birds are common in coastal and southern parts of the breeding range (for example, 40 per cent dark in Labrador, 60 per cent dark in Britain, 89 per cent dark in southern Iceland). Light birds predominate at inland continental sites (for example, about 100 per cent light in central Russia) and in the high Arctic (for example, about 100 per cent light in the Canadian Arctic islands), sometimes almost to the exclusion of the dark birds (Cramp 1983). The distribution of the morphs agrees with Gloger's Rule. The rule says that dark pigments in feathers increase in humid parts of the breeding range, whereas lighter pigments prevail in dryer areas (Terres 1982).

In addition, O'Donald *in* Cooke and Buckley (1987) showed that

polymorphism in the Parasitic Jaeger was maintained by a combination of natural selection favouring light morphs and sexual selection favouring dark morphs. Females, especially dark females, prefer to mate with dark males (assortative mating). Therefore, dark males take less time to find a mate and they breed earlier than light birds, gaining a selective advantage of "earlier breeding and increased reproductive success".

Light Morph Adults

Most adult Parasitic Jaegers seen in Ontario are light morph birds. For example, in northern Ontario, Bruce Di Labio (pers. comm.) observed nine light morph adults on 15 September 1994 at Shipsands Island (near Moosonee) at the south end of James Bay during strong northeast winds. In southern Ontario, Rupert (1995) reported that 90 per cent of the adults seen at Sarnia at the south end of Lake Huron were light morphs.

Typical light morph adult Parasitic Jaegers are mainly white on the throat, breast and belly; they may have a gray band across the breast like the bird in Figure 1. The undertail coverts are usually darker but may be whitish. See the illustration of a light morph adult on Plate 39 in Godfrey (1986).

Dark Morph Adults

Dark morph adult Parasitic Jaegers are much rarer than light morphs in Ontario. See the bottom bird in Figure 1 and the illustration of a dark morph adult in flight on Plate 39 in Godfrey (1986). Many dark morph adults are uniformly dark brown with the cap being only slightly darker. Dark morph birds have not been

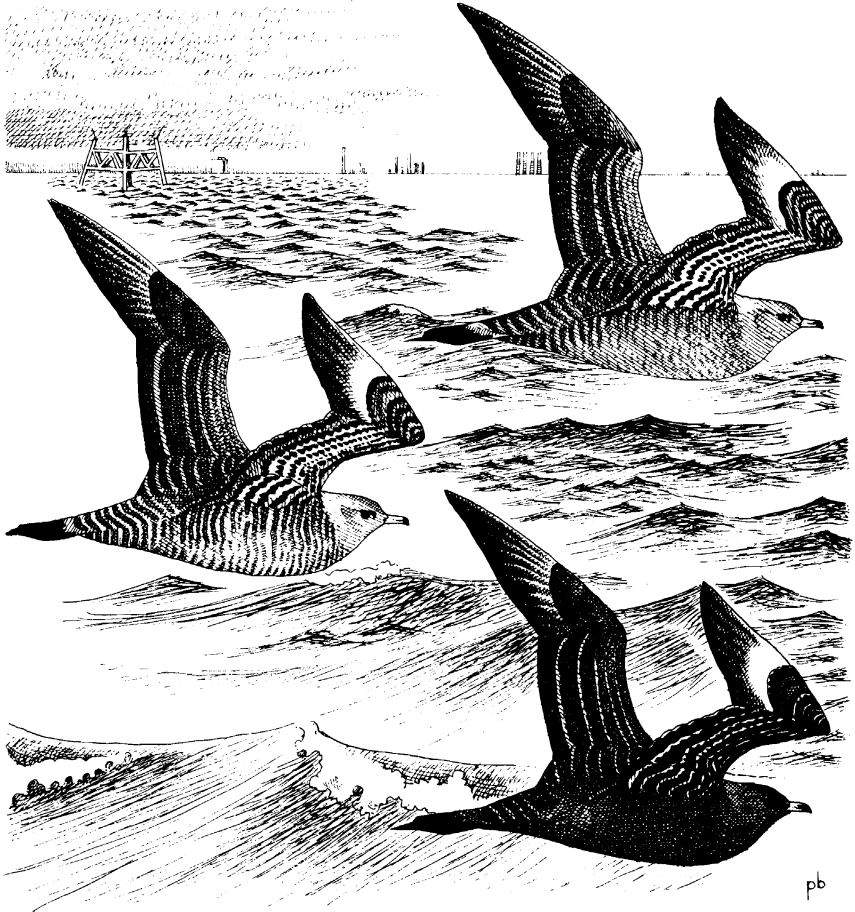


Figure 2: Juvenile Parasitic Jaegers: light morph (top), intermediate morph (middle), and dark morph (bottom) at Van Wagner's Beach, Hamilton. Drawing by *Peter Burke*.

reported breeding in northern Ontario to our knowledge. At Churchill, Manitoba, Jehl and Smith (1970) state that the breeding population "consists entirely of light- or intermediate-phased birds, but a few dark-phased individuals occur in migration".

Describing the 1974 Hamilton boat trip on 22 September, Curry (1974) wrote, "About twenty minutes out from the Canal, the familiar excited cry of 'Jaeger' rang out. All eyes peered to port. It was a dark bird flying left - probably an immature Parasitic? But a closer look revealed a ramrod straight thin tail and a dark cap against smooth, dark brown underparts, revealing it as the first dark-phase adult Parasitic Jaeger most of us had ever seen locally". Rupert (1995) reports that 10 per cent of the adults seen at Sarnia are dark morph birds. This percentage is higher than at Hamilton and elsewhere on the Great Lakes.

Intermediate Morph Adults

Intermediate morph adult Parasitic Jaegers are variable, but most are closer in appearance to dark morph adults because the gene controlling dark coloration is incompletely dominant over the gene for light coloration. See Figure 1. A few intermediates show a distinct junco-like hood and dark undertail coverts contrasting with a white belly. Plate 55 in Harrison (1983) illustrates a pale intermediate showing a very dark chest band contrasting with a white throat and belly. Note also that the intermediate morph adult illustrated on Plate 64 in Cramp (1983) is a pale extreme in our classification, being much paler than most intermediates.

Based on his genetic studies,

O'Donald *in* Cooke and Buckley (1987) describes intermediate adults as "dark with a variable amount of lighter plumage around the cheeks, collar and breast; the bases of the breast and belly feathers are white. Those intermediates with a very white base to their belly feathers show a distinctly lighter belly compared to the dark birds, who have no white base to their belly feathers. But the darkest intermediate birds cannot always be distinguished from the dark birds, except by examination of the belly feathers; even then, dark intermediates merge into darks in a continuous sequence".

Intermediate morphs are rarer than light morphs in Ontario. Their status is unknown because many intermediates were probably called dark morphs in the past.

Juveniles

Parasitic Jaegers retain their full juvenile plumage during fall migration in southern Ontario. The molt to first winter plumage takes place on the wintering grounds. Figure 2 shows typical light, intermediate and dark morph juveniles. See also the perched intermediate morph juvenile on Plate 39 in Godfrey (1986). Most juveniles seen in Ontario are light or intermediate in coloration, but often appear dark at a distance over water.

Juveniles usually outnumber adults on the Great Lakes. For example, Rupert (1995) reported over an 18 year period that two-thirds of the Parasitic Jaegers seen at Sarnia were juveniles. On the 23 September 1973 Hamilton boat trip, Curry (1974) reported that 23 jaegers were seen, "none of which was adult". Bob Curry (*in litt.*) noted that "Most

years juveniles outnumber adults considerably but a closer look at the data reveals a more interesting temporal pattern. The majority of adult Parasitics at Hamilton occur in September and very early October while most birds seen later than this are juveniles. Thus, in some years adults outnumber juveniles in September in the ratio of 3:2, but taking into consideration the entire season juveniles will almost always greatly outnumber adults''.

Interestingly, more adults than juveniles have been seen in Ottawa over the years (Bruce Di Labio, pers. comm.), perhaps indicating that Ottawa is nearer the main route of adults from James Bay to the Atlantic (Michel Gosselin, pers. comm.).

Morphs of the juvenile are highly variable, ranging from light to dark, the main difference being the extent of barring on the undersides. Cramp (1983) describes three morphs: light, barred (intermediate) and dark. Distinguishing juveniles from adults at a distance is difficult to impossible. At close range, typical light and intermediate morph juveniles are streaked on the head and neck, barred below, and edged with rufous above and below. The pointed central tail feathers are short and project only slightly beyond the others. Extremely dark morph juveniles are uniformly sooty-black and are difficult to separate from dark morph adults unless the length of the tail projection or fresh juvenile plumage can be seen.

The sequence of colour changes from juvenile to adult is complex and poorly understood. Olsen (1989) notes that dark juveniles may become light adults! Readers are referred to Cramp (1983) and Olsen (1989) for more

information on plumages and morphs. See also the excellent article and illustrations by Jonsson (1984) on the identification of juvenile Pomarine (*P. pomarinus*) and Parasitic Jaegers.

Summary

Adult Parasitic Jaegers occur in three colour morphs: light, intermediate and dark. Most adult Parasitic Jaegers seen in Ontario are light morph birds, whereas intermediate and dark morph adults are decidedly rarer. Genetic studies indicate that intermediate morph adults are darker and more like dark morph birds in appearance than the intermediates described and illustrated by most authors. Our illustration of an intermediate morph adult is therefore more typical of a genetically intermediate bird. Juveniles also occur in three morphs. Juveniles seen in Ontario tend to be light or intermediate in coloration, but often appear dark at a distance. Juveniles usually outnumber adults on the Great Lakes in fall.

Acknowledgements

The following people provided us with information and helpful comments on the first draft of this article: Dawn Brenner, Bill Crins, Jim Dick, Rob Dobos, Jon Dunn, Earl Godfrey, Michel Gosselin, Jean Iron, Ross James, Alvaro Jaramillo, Kevin McLaughlin, Dennis Rupert, Ron Tozer and Mike Turner.

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