

yellowish-brown, the beak is grayish-yellow, and the feet are gray-black. The hen is usually smaller, green with black markings on the back but these are less sharply profiled than those of the male. The tips of the tail feathers are less black and in some females the black is absent altogether. Length: about 6 1/3 in. (16 cm) including the 2 1/3 in. (6cm) tail.

Lineolated Parakeets are native to Central America from southern Mexico to western Panama. They are especially prevalent in the mountains and along the Talamanca Cordillera. They often travel in pairs but also in groups of 70 or more individuals. Because of their small size and cryptic coloration, these birds are difficult to observe in the wild. They live in wooded country interspersed with meadowland. They are even seen regularly close to volcanoes.

These birds are usually available commercially and may be kept in aviaries with other small exotics since they are so peaceful and non-aggressive. They spend much of their time on the ground, both in the wild and in captivity, seeking seeds and insects. It is recommended that the flight floor be regularly (and deeply) raked and that the upper layer be completely changed occasionally to help prevent worm infestations. The worm eggs adhere to sand particles (literally dozens on a grain of sand). Obviously, a concrete floor is recommended as it is the most hygienic.

These attractive little hookbills are not at all destructive in their aviary; they climb slowly up the branches—preferably 1 1/2 in. (4 cm) in diameter or hang head downward in careful acrobatics. They are sensitive to low temperatures and must be kept in mildly heated indoor accommodations during the fall and winter. Supplementary food includes sunflower seeds, hemp seeds (not too much as it makes them too fat), all kinds of millet (including spray millet) and a rich assortment of greens. It will also do no harm to give a regular multi-vitamin and mineral supplement. With good husbandry, a pair should go to nest.

Matthew Vriends is a Dutch born biologist/ornithologist who holds many advanced degrees including a Ph. D. in zoology. He has written over 80 books on birds and other small animals. He has achieved many first breeding results in his large aviaries which house more than 50 species of tropical birds. ➔

Parrotlets: Their Identification, Care and Breeding

by Sandee & Robert Molenda
Santa Cruz, California

Relatively unknown 10 years ago, parrotlets are rapidly becoming one of the most popular parrots in aviculture. They are also one of world's smallest with only the African Pigmy Parrot being smaller. Being true parrots, they are most closely related to the large Amazons. Often confused with the *Brotogeris* genus, parrotlets can be distinguished by being considerably smaller and having short, wedge-shaped tails. There are three different genera of parrotlets: *Touit*, *Nannopsittaca* and *Forpus*, all of which are found in either Mexico or South and Central America. Since only *Forpus* parrotlets are available in the United States, no further mention will be made of the other two genera.

These tiny parrots are various shades of green with patches of yellow, gray and blue which identify the species. All parrotlets are sexually dimorphic. Identification of the male of a species is made upon the particular shade and

location of blue he possesses. The females are more difficult to identify so close attention must be paid to small details such as subtle changes in the shades as well as the distribution of yellow and green feathers.

The Pacific or **Celestial Parrotlet** *Forpus coelestis* is the most well-known and popular species of parrotlet. They are approximately 5 in. in length and weigh 30 g. In the wild, they are found from western Ecuador to north-western Peru. The males have a cobalt-blue streak of feathers extending from the eye as well as cobalt-blue on the rump and wings. Many females also have an eye streak as well although it is emerald green rather than cobalt. They have dark green backs and wings with yellow-green feathers around the face. The legs and beaks of both sexes are pink when hatched and gradually turn horn-colored upon maturity.

A subspecies has recently been rei-

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identified, having first been reported in 1932 by Karl Pathe of the Chicago Zoo. Found in Columbia, *Forpus coelestis lucida*, are slightly larger and heavier than their Peruvian cousins. The males have gray backs and wings as well as a band of gray-mauve across the chest. They also have very pronounced eye streaks that extend to completely encircle the head and nape. Also, the blue on the rump and wings is a lighter, brighter blue than in the nominate. Females also have a blue rump although it is turquoise not cobalt. These hens also possess turquoise eye streaks and often have blue on their wings as well. Female Yellow-faced Parrotlets are the only other species in which females have blue feathers. Both males and females have bright, lime-green faces with horn-colored beaks and legs.

Pacific Parrotlets are the most aggressive and fearless species. They are also extremely territorial, especially the hens. You cannot keep more than one pair in a cage. If given a chance, they will attack other animals, including parrots much larger than themselves. Handfed babies make wonderful pets if placed in a home right after weaning

and handled regularly. Being highly intelligent they often can be taught to do tricks and can learn to talk. Pacific females tend to be more dominant than the males and can become nippy at maturity if not handled often. It is not unusual for Pacific pairs to bicker with each other when they are not raising babies. Most pairs make excellent parents once they get the hang of it.

Another common species, **Green-rumped Parrotlets** *Forpus passerinus*, are also the smallest weighing around 22 g and less than 5 in. in length. They are native to Guyana and have a delicate, streamlined body with a small beak in proportion to their heads. The beaks and legs are horn-colored. Predominantly apple-green, the females have a patch of yellow feathers between their eyes above their nostrils. The males have bright, cobalt blue on their primary wing feathers while the secondaries are turquoise. They are the only species of parrotlet in which the males have green rumps instead of blue.

Forpus passerinus viridissimus, is found on the islands of Trinidad and Jamaica as well as northern Venezuela to northern Columbia. The males are a darker forest green than the nominate and the females have much more yellow between their eyes. Females are also rather aggressive compared to the other Green-rumped. This subspecies is fairly common in the United States.

Another subspecies found in this country is *Forpus passerinus deliciosus*. Native to northern Brazil along the banks of the Amazon, this subspecies is the smallest weighing only 18 g. Bright apple-green, the males are the only Green-rumps to have a light turquoise-blue wash of color over their rumps. Aside from being very tiny, the females are no different from the nominate.

The male *Forpus passerinus cyanophanes* native to northern Columbia, has more dark blue feathers on the upper wing than the nominate. This forms a patch of color that can be seen when the wing is folded. The female is indistinguishable from the nominate.

Forpus passerinus cyanochlorus is found only near the upper Branco River in northern Brazil. The males are very similar to the nominate, however, the females are a much lighter shade of yellow-green.

Green-rumped are sweet, affectionate birds and make wonderful pets, especially for children. They are not as

aggressive or territorial as Pacifics, being much more timid and shy. However, they are just as intelligent and love to play just as much as their more feisty cousins. They are also a relatively easy species to breed with almost no aggression between pairs. Unfortunately, Green-rumped are often prone to beak abnormalities such as overgrowing and being miss-shaped. No explanation can be found for this phenomena as nutritional deficiencies, genetic flaws, environment and medical problems have been excluded in most cases. One theory is that birds in their native habitat use their beaks in some manner which wears them down quickly therefore they must grow rapidly to keep the beak healthy. Or perhaps there are some trace minerals which the birds require but is not available in a captive setting.

No other species is found as far north as **Mexican Parrotlets** *Forpus cyanopygius*. Native to north-western Mexico, they are one of the larger species at 5½ in. and weighing almost 40 g. Both sexes have gray beaks and legs, however, females' beaks do not turn gray until they are ready to breed. The males have bright turquoise rumps, primary and secondary wing coverts. While most species of *Forpus* are energetic and playful, Mexicans are the exception. The breeding pairs are lethargic, hardly doing anything other than sitting on their perches. They are also quite finicky about eating, often ignoring their fruits and vegetables. Mexicans also incubate their eggs longer than other species taking 24 days instead of 21. While the babies are much larger at hatching, they grow more slowly although they wean at approximately the same age. Most Mexicans will only breed in a colony situation of more than three pairs. Unlike the other species, they will only produce one clutch a year and sometimes one clutch every other year. Unfortunately, they also tend to be much more susceptible to stress which makes them stop eating, which makes them vulnerable to bacterial infections from which they often do not recover.

One subspecies, *Forpus cyanopygius pallidus*, is found from south-eastern Sonora to north-western Mexico. In both males and females the plumage is lighter green with a gray tinge and the underparts are more yellow than in the nominate.

Forpus cyanopygius insularis is found only on two of the Tres Marias Islands

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and is believed to be greatly endangered. This subspecies is identified by a dark green head, back and wings as well as blue-green underparts. The face is yellow-green and the males' rumps and wings are darker turquoise than in the nominate.

Often confused with Mexican Parrotlets, **Blue-wingeds** *Forpus xanthopterygius* are not as heavy and stocky as their northern cousins, weighing approximately 35 g. Found in Paraguay, north-eastern Argentina and eastern Brazil, Blue-wingeds are darker green and have very large eyes which helps distinguish them from Mexicans. Additionally, the males have dark violet blue rumps and wings instead of bright turquoise and females have more yellow around their face. Although more prolific and easier to breed than Mexicans, they are difficult to find. Both males and females have gray legs and beaks.

Forpus xanthopterygius flavissimus is native to north-eastern Brazil. Generally paler green with more yellow underparts, both males and females possess bright yellow faces, cheeks and throats which is very prominent. This subspecies is fairly common in Europe but unavailable in the United States.

Native to eastern Bolivia and central Peru, *Forpus xanthopterygius flavescens*, has plumage which is lighter and more yellow than in the nominate. The blue on the males is also lighter and females have more yellow on the face and forehead but not on the throats as in *Forpus xanthopterygius flavissimus*.

Found in north-eastern Peru, south-eastern Columbia and north-eastern Brazil, *Forpus xanthopterygius crassirostris*, males have gray violet primary coverts and secondaries are dark violet blue. Females are smaller than the nominate and are more green. The upper beak is compressed laterally in the middle, which is prominent in both sexes.

Only found in two locations along the Amazon River in north eastern Brazil, *Forpus xanthopterygius ollalae*, are dark green birds with the males' rumps and wings being darker blue than in the nominate.

The male *Forpus xanthopterygius spengeli*, native to the coastal region of northern Columbia, can be distinguished from the nominate by the dark turquoise blue rumps. The primary coverts are violet blue with the secondaries being dark turquoise. Females have more

yellow on the forehead.

Spectacled Parrotlets *Forpus conspicillatus* previously unavailable in the United States until the fall of 1992 when several pairs were imported from Europe. These little guys are at the small end of the scale weighing around 28 g and less than 5 in. in length. Males are a deep, rich evergreen with a bright blue eye ring, cobalt rump, primary and secondary coverts, secondaries and under wing coverts, bright violet blue on the primaries and rump. Females are not as dark green as the males and also have an eye ring however it is emerald not blue. Both males and females have horn-colored beaks and legs. Spectacles are the only parrotlets with a true eye ring. Although these birds are rare, they are also quite prolific and relatively easy to breed.

Spectacleds have incredible personalities and are interested in everything going on around them. Often, they follow me around their cage as I feed and pick up dishes. Being voracious eaters, they consume everything given to them and are especially fond of fruits and vegetables. Unlike Pacifics, they remain sweet and gentle even after months of not being handled.

Forpus conspicillatus metae is found in central Columbia and western Venezuela. The males have bright green heads with yellow-green faces and throats. The eye ring is a thin partial line of blue feathers. Females have more yellow overall than in the nominate.

In south western Columbia, *Forpus conspicillatus cauae*, can be identified by its large, heavy beak. Also, the blue plumage of the males is lighter and less violet than in the nominate.

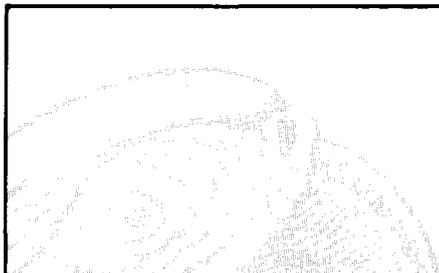
The rarest and largest species is the **Yellow-faced Parrotlet** *Forpus xanthops* weighing 50 g and almost 6 in. in length. These large birds seem more closely related to lovebirds rather than to parrotlets. They are found only in one extremely remote valley in northwestern Peru. The males have deep violet blue primaries and secondaries similar to male Pacifics including the blue eye streak. Females also have blue rumps which is lighter than the males. As the name implies, both males and females have bright yellow faces. They also have horn-colored legs and beaks with a dark stripe running down the front of the upper beak. As in Mexican Parrotlets, Yellow-faced require 24 days to incubate their eggs instead of 21. There are only four verified pairs of Yellow-

faced in the United States and a handful of single males although they are readily bred in Europe. Unfortunately, with the import ban currently in effect, the future of the magnificent birds is in doubt in this country.

The **Slater's** *Forpus sclateri* is approximately 5 in. in length. They have never been imported in the United States and are rarely bred in Europe. The males' lower back and rump are deep violet blue which is darker than in any other species. The primary and secondary-coverts, secondaries and under wing-coverts are also blue violet. The upper mandible is gray and the lower is horn colored. The legs are grayish brown.

There is only one subspecies of Slater's parrotlets, *Forpus sclateri eidos*. Native to western Guyana, Venezuela, Brazil and Columbia, the males are lighter green and have lighter blue than in the nominate. The females are also lighter green with more yellow, especially on the breast.

Parrotlets, particularly hens, should be at least a year old before they attempt to breed or they can become egg bound and die. Males who are too



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young often do not provide enough food for the hen and the babies which are then abandoned or destroyed. Young pairs can be kept with one another until they go through their first molt, then they should be separated until they are at least 11 months old. It is not uncommon to have handfed birds begin laying as young as seven months – which can be disastrous.

The birds breed best when there are more than one pair in the facility and they can hear but not see each other. Pairs can be separated by wood barriers, foliage, burlap or even cardboard between the cages. Handfed birds generally make the best parents as they are not as sensitive to stress and are used to people. Be careful, however, handfed birds have no fear of people and, females especially, will inflict a painful, bloody bite if given a chance. Parrotlets also have a much deserved reputation for not letting go once they latch on. When removing babies, a piece of cardboard can be used to hold the hen back as she will not usually leave the box the way males do. Females have been known to attack babies as they were being pulled so the utmost cau-

tion must be used.

Most parrotlets breed well in a minimum cage of 18 in. x 18 in. x 24 in. long. Cages should have pull out trays with grates to keep the birds off the bottom. They can also be bred successfully in 3 - 6 ft. long flight cages. Both Mexicans and Yellow-faced breed much better in flights than in small cages. Not surprisingly, many breeders feel their birds are in much better condition and have more production with large flights. Food and water should be placed so they are not soiled by droppings. Natural wood perches of varying sizes must be sturdily attached to the cage. Infertility can sometimes be traced to wobbly or unstable perches. Nest boxes, 6 in. x 7 in. x 10 in. long are hung on the outside of the cage and filled with about 2 in. of untreated pine shavings. Boxes should be placed on the front of the cages so when the birds look out, they see only the inside of their cage. Some birds, particularly Green-rumped, are fond of throwing the nest material out of the box so be sure to keep it replaced. Babies can develop crippling orthopedic problems if left on the bare floor. Conversely, sometimes birds will bury

their eggs and lose them in the shavings. Mexican Parrotlets seem particularly prone to this habit. If this is the case, remove the shavings a little at a time until the problems ceases or try using heavier shavings. In any case, by checking nest boxes daily, you will be able to monitor the pairs and deal with any problems as they arise. Also, following a routine will teach the birds to tolerate your interference.

Parrotlets are extremely active birds and require a great deal of fuel. Gram for gram, they eat more than a macaw. Pairs feeding babies will often consume three or more times the normal amount of food. Handfed parrotlets should be introduced to a wide variety of foods while young. A good-quality small hookbill or cockatiel seed mix should be fed. A large hookbill seed mix can be provided, however, parrotlets are unable to crack open the nuts often contained in these mixes. They can also be fed a commercial pelleted diet, however, parrotlets are one of the few birds who require some seed in the diet, particularly breeding pairs. Fortunately, they will usually eat both seeds and pellets, unlike most parrots. Whether fed seeds or pellets, they still require fresh fruits, vegetables and greens daily. Breeding pairs also need sprouted seed, egg food, cooked beans, whole-grain breads, potatoes, rice and pasta which should be fed several times a week. Fresh water, mineral block and cuttlebone should be available at all times. Powdered calcium and vitamins should be sprinkled on the soft foods. Spirulina can be added to the egg food, if desired.

Finally, the importance of calcium cannot be stressed enough. Cuttlebone and mineral block should always be available. Most hens will devour massive amounts of cuttlebone immediately before they lay eggs. It is common for a hen to eat a 6 in. cuttlebone once a week for several weeks prior to laying. If the hens do not receive enough calcium they will certainly become egg-bound.

The male will usually investigate the box first and when he deems it safe, will try and entice the female into it. Once mating has taken place, the hen will lay from four to eight eggs although Pacific hens have been known to produce 10 fertile eggs. She will hardly leave the nest box from several days prior to laying until the last baby is gone, which can be as long as nine or 10 weeks! Females lay one egg every other day. In most



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species, the babies take 18 to 21 days to hatch. Remember, Mexican and Yellow-faced Parrotlets are the exception and usually take 24. In all species of parrotlets, the females incubate the eggs and the males provide food and protection. Sometimes the hen will allow the male into the box and even incubate the eggs but this seems to be an individual preference in each pair.

As with all baby parrots, parrotlets are blind, deaf and almost naked when they hatch. Even so, they have loud cries for their tiny size as Green-rumped, Blue-winged and Spectacleds can often be heard begging for food when only a few hours old. They are extremely tiny when they hatch – no larger than a bumble bee. Unlike many species of parrot, parrotlet hens begin incubating almost immediately after laying the first egg, therefore the babies hatch in the order the eggs were laid. This leaves a great deal of age difference between the oldest and youngest babies, especially in large clutches. Most breeders who handfeed, leave the babies with their parents until they are 10-14 days old. Babies should be placed in a brooder which is set at 89°F and checked often to make sure they are comfortable. Birds that are younger than eight days, particularly Green-rumped and Spectacleds, need a temperature of 91° or higher. They are fed every four hours beginning at 7:30 A.M. and ending at 11:30 P.M. Younger chicks are fed more frequently and given a 2:00 A.M. feeding. Parrotlets can be fed with a spoon or syringe. Ten-day old babies generally take between one and two cc's per feeding, gradually working up to a maximum of six by the age of three weeks.

As with any good breeding program, accurate records are a must. Each baby should be closed-banded and all information as to parent identification, date egg was laid, date of hatch, date baby was pulled and medical or veterinary information should be recorded. In addition, babies should be weighed each morning prior to their first feeding so as to monitor gains and losses.

Babies show an interest in solid foods when they are approximately four to five weeks old. They should be given millet spray, finely chopped fruits, vegetables and greens, whole grain bread, small seeds such as finch and cockatiel, pellets, cooked rice and pasta. Dry foods are scattered over the bottom

of the brooder; cooked foods are placed in flat dishes. The temperature in the brooder is gradually lowered to room temperature as the babies feather out. At about five weeks, they are placed in a large weaning cage with low perches and food is fed on paper plates or small flat dishes placed on the bottom of the cage. By the time the birds are six weeks of age, they are usually completely weaned. However, birds are individuals, if one is weaning more slowly than the others, he should continue to be fed. It is better to continue feeding a few more days than have a tragedy. Some species, such as Blue-winged and Spectacleds take longer to wean, usually eight weeks rather than six.

The sex of parrotlet babies can be determined when they are about three weeks old. By the time their pin feathers are growing in, you can see the blue feathers of the males. Mexicans, Spectacleds and Blue-winged, sometimes take as long as their first molt to produce the blue feathering on the rump, but it is evident on the wings as soon as they begin to feather out. Coloring enhancement after the first molt can also occur in various sub-

species such as the hens of the Pacific subspecies *Forpus coelestis lucida* and the males of the Green-rumped subspecies *Forpus passerinus deliciosus*.

As with all bird breeding operations, cleanliness and sterilization is an absolute must. While common chlorine bleach is okay for disinfecting most equipment such as feeding dishes, cages, baskets, tubs and scales, a virucide/pseudomonacide such as Wavecide, Viron, Rocal-D, Avinol or Kennesol should be used for soaking syringes, feeding spoons, brooders and anything that has been in contact with either babies or a sick bird. Also, use common sense such as never bringing strange babies into the nursery and always quarantining new birds for at least 60 days.

Whether breeding parrotlets for the pet market or trying to establish captive breeding cooperatives for conservation, these diminutive parrots have a lot to offer. They are beautiful, intelligent, quiet, hardy and relatively easy to breed. Hopefully, as aviculturists, we can find a place in our hearts as well as our aviaries for these fascinating birds so they will be available for future generations.



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