TRAGOPAN FEMALES CAUSE SENSATION IN THE BENELUX

by F. HERMANS, Kabricht 18, B 3770 RIEMST Belgium
Riemst, July 1989

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PREFACE

The problem with amateur breeders is that they freely crossbreed pruducing hybrids which most of the time will show characters of both species. In such a progeny it would be very difficult to establish a pure line unless some very careful breeding is carried out to filter out the genes of one particular species. It should not be very difficult to distinguish between a pure-bred female of one species and an individual which is cross-bred since the latter will show visual characters of both species. However, it is possible to have an individual which is showing all the characters of being pure and yet have genes of another species which may become appparent only by chance at a later generation.

Dr. Kr Suresh Singh, Lucknow
India, dated 29th June 1989

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1 INTRODUCTION

During 1986-1989 many lectures were delivered by the author at regional meetings of AVIORNIS International concerning the position of the genus *Tragopan* in captivity and in the wild. During these meetings and on the Jubileum feast of the World Pheasant Association (W.P.A.) chapter Benelux on 22-23 April 1989 there was some confusion about the identification of the females of this genus. It was mooted that it was almost impossible to distinguish or to identify *Tragopan* females.

In this paper some of these matters are discussed and certain points clarified.

2 SITUATION OF THESE BIRDS

2.1. The systematic position and the distribution in the wild

According to Delacour (1951) and Johnsgard (1986) these birds belong to the order *Galliformes* and the family *Phasianidae.* One of the most beautiful Galliformes are the Tragopans from the mountainous regions of the Himalayas and the Far East, from Kashmir eastward to the south of China. Here occur the five species in the humid mountainous forests altitude of 1000 to 4000 m.

The distribution of the five species has been indicated in Table 1. The smaller states such as Nepal, Bhutan, Sikkim, etc. have not been given. A detailed geographical distribution has been given by Johnsgard (1986).

Table 1 : The five species of *Tragopan* and the countries of origin
(Hermans F., Belgium 1989)

Scientific name	English name	Country of origin
Tragopan melanocephalus	Western Tragopan	India & Pakistan
Tragopan satyra	Satyr Tragopan	India & China
Tragopan temmincki	Temminck's Tragopan	India & China
Tragopan caboti	Cabot's Tragopan	China
Tragopan blythi	Blyth's Tragopan	India, China & Burma

Since no living specimens of the two subspecies *caboti guangxiensis* (Cheng Tso-hsin 1979) or the Western Cabot's Tragopan and *blythi molesworthi* (Stuart Baker 1934) or the Western Blyth's Tragopan have been brought into the West, these two will not be discussed further here.

2.2. Status in the wild

Recent field surveys indicate that the status of the genus Tragopan is far from good. Johnsgard (1986) writes that the position of *melanocephalus* and *caboti* is most critical. These data have been confirmed by Singh S. (pers. comm. Singh S., Lucknow, India (1988) and Zheng G. (pers. comm. Zheng G., Beijing, China (1989)). Also not safe are *blythi* (Zeliang 1981) and *satyra* (Yonson & Lelliot 1981). It seems that there are no such problems for *temmincki* due to the wide distribution of this species (pers. comm. Zheng G., Beijing, China 1989). Different researchers agree that the greatest danger for these birds in the wild is man (pers. comm. Singh S., Lucknow, India (1988)). The continuous increase of the Asiatic population and the indiscriminate destruction of the natural habitat of these birds are the well-known facts (Aschenbrenner 1987)).

2.3. Situation in the Benelux

During the last 100 years several specimens of the five species *Tragopan* have been imported into the West and have been bred in captivity (Ghigi 1968). Also in the Benelux countries Tragopans have been kept in earlier times and successfully maintained (Van der Mark 1979). Each pheasant breeder knows these beautiful birds and wants to keep them in his aviaries. This great human interest in due to their splendid feather patterns, their gentle character and quick adaptability to our North Sea climate. The strikingly beautiful pictures on the wattles and the blue vibrating horns of the displaying males is a well-known and respected feature. The many publications in national and international magazines on this genus are proof of their popularity.

The best represented species in the Benelux currently are *temmincki* and *satyra*. Absolute numbers for both species are hard to give, although it might be stated that both species are present in comparable numbers as the Golden Pheasant (*Chrysolophus pictus*) an the Lady Amherst Pheasant (*Chrysolophus amherstiae*). An analysis of the advertisements in AVIORNIS-International issues 80 to 85 (Aviornis 1988/1989) indicates this situation. These numbers do not demonstrate that Tragopans are as easy to rear as for instance the Ruffed Pheasants but only shows the enormous attention that private breeders in the Benelux have paid on these birds during the last two decades. Next in numbers comes *caboti* which is still rare and is discussed further in chapters 3 and 4. From *blythi* there are 3 unrelated and pure bred pairs present in the collection of the author.

Importation of wild-caught Tragopans into the west is very difficult and complex due to the recent international and national legislations. Everything indicates that breeders in the West will have the availability of the actual material at their disposal only in the future. No accurate data upon the available genetic variability have been collected systematically by anyone in the past. Hence that it is very difficult to construct a scientific and detailed breeding program for this genus.

At the time of writing several organizations in the Benelux are trying to change this situation. AVIORNIS-International for instance has now an internationally recognized

and functional legband pedigree-system through, which it is possible to get an idea of the numbers, the reproduction, the genetics and the survival chances of ringed birds. W.P.A.-International is maintaining studbooks for *caboti* and *blythi*. Experience however shows that the realization of these efforts is a complicated matter.

2.4. C.I.T.E.S.

As a result of the dangers described in chapter 2.2. *melanocephalus*, *caboti* and *blythi* have been listed in appendix I of the C.I.T.E.S. *Tragopan satyra* has been put in appendix III on advice of the Government of Nepal (King B., (1981)).

The aim of this international convention in trade of endangered species is in the first place the protection of the wild populations by the regulation of the import, transport and export of the respective species. Ironically enough, Tragopans in nature are still not directly protected by the C.I.T.E.S. because of it being an international agreement and hence the trade in these birds has almost never affected the wild populations.

The actual position of the five species of Tragopan in the Benelux in May 1989 has been outlined in Table 2 along with their status in the C.I.T.E.S. (effective from 22th October 1987).

Table 2 : The actual position of the five species *Tragopan* in the Benelux and their classification on the appendices of the C.I.T.E.S (Hermans F., Belgium 1989)

Scientific name	Position in Benelux	C.I.T.E.S
Tragopan melanocephalus	?	I
Tragopan satyra	good	III
Tragopan temmincki	good	---
Tragopan caboti	?	I
Tragopan blythi	?	I

This table explains that the less threatened species (*satyra* and *temmincki*) are well represented in the Benelux collections. For the three species that have been listed on appendix I (*melanocephalus, caboti* and *blythi*) the situation is rather critical. Precise data on these species are not available. One thing which is known for sure is that all these species are rarely seen in the Benelux and only occur in exceptional cases. The artificial reproduction of these species is rather complicated due to the lack of new genetic material. This is a regrettable situation since so many pheasant breeders are living in the Benelux. A perusal of the older literature (Ghigi (1968); Delacour (1977)) shows that *melanocephalus, caboti* and *blythi* reproduce at a higher rate in captivity than *satyra.* This is a fortuitous and significant circumstance which can be profitably exploited if sufficient genetic material from these species can be exported to the West in the future.

On the other hand it so happens that all Tragopans are less protected by the actual tackling of the C.I.T.E.S since the supply of the desperately needed new blood is limited. Also because a flexible and quick transport within the E.E.C. and North America is rather complicated; the export of wild-taken members of species listed in appendix I is practically forbidden by the C.I.T.E.S. The export of captive members of such species involves much paper work, like C.I.T.E.S.-certificates, import permits, health certificates, customs permits, quarantine, expensive telephone communications, and so on. A simplification of these bureaucratic measures within all E.E.C.-countries would be most welcome. Furthermore, the transport of captive raised specimens is complicated by some countries which were signatory to the C.I.T.E.S. because they wanted to discourage private persons and institutions who were interested in these birds.

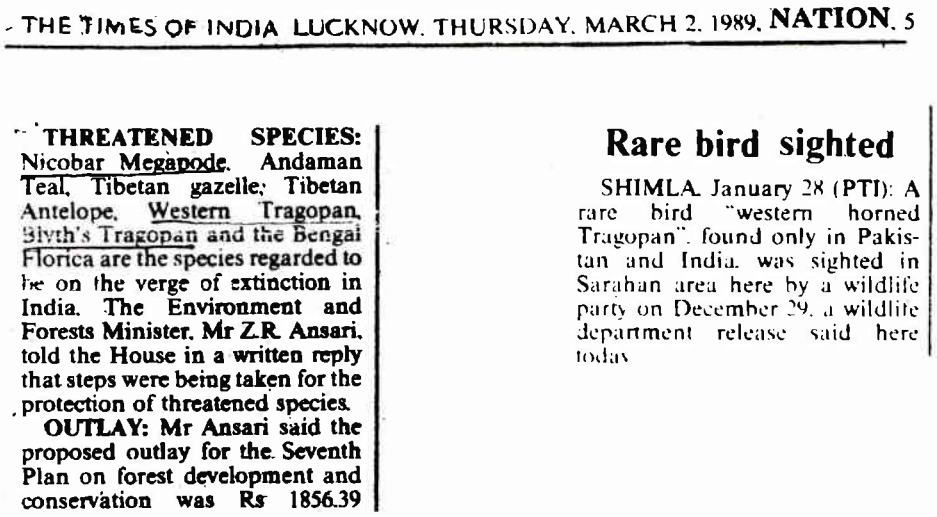
It seems that the present breeders in the west have to pay the bill for the ruthless and unscrupulous practices of some of the former reputed dealers when freshly imported Tragopans were sold for the highest price that any party could pay. The survival of the former wild-taken birds was of minor importance. They were even less concerned with the source from which these birds were derived from or to which place which offspring had to be moved to. Mostly this information was kept confidential. It is clear that under those circumstances a lot of harm was done and it is hoped that all these practices belong to the past.

Fortunately the exceptions prove the rule and we, Belgians, are glad that our C.I.T.E.S. offices have proved their worth since 1984. The pious hope of the author is that the C.I.T.E.S. authorities in the respective countries will deal with such matters with openness and mutual respect when it comes to the preservation of these Tragopans in captivity.

2.5. To a full protection of the genus Tragopan

The full protection of these birds in the wild can only take place by the establishment of protected nature reserves in their native countries. Steps in this way have been taken for *caboti* in China (Johnsgard 1986) (pers. comm. Zheng G. Beijing, China 1989) (Zheng G., 1987). Proposals in this matter have been formulated for *melanocephalus* in Pakistan (Islam K. & Crawford J., (1986)). Fortunately, the Govt. of India is planning the conservation and protection of these birds. In figure 1 two press-cuttings copied from The Times of India, Lucknow dated the 2nd of March 1989 are reproduced. It is stated that the Govt. of India is undertaking steps to preserve endangered species such as *melanocephalus* and *blythi*. Also that *melanocephalus* has been sighted on the 29th December 1988 near Shimla in Himachal Pradesh and Uttar Pradesh, India.

Figure 1 : Press-cuttings on the preservation of *melanocephalus* and *blythi* by the Indian Government (dated December 1988 and March 1989) (Singh R., India 1989)



THE TIMES OF INDIA LUCKNOW, THURSDAY, MARCH 2, 1989. **NATION**, 5

THREATENED SPECIES: Nicobar Megapode, Andaman Teal, Tibetan gazelle, Tibetan Antelope, Western Tragopan, Blyth's Tragopan and the Bengal Florica are the species regarded to be on the verge of extinction in India. The Environment and Forests Minister, Mr Z.R. Ansari, told the House in a written reply that steps were being taken for the protection of threatened species.

OUTLAY: Mr Ansari said the proposed outlay for the Seventh Plan on forest development and conservation was Rs 1856.39

Rare bird sighted

SHIMLA, January 28 (PTI): A rare bird "western horned Tragopan", found only in Pakistan and India, was sighted in Sarahan area here by a wildlife party on December 29, a wildlife department release said here today.

Experience shows that all this sounds very satisfactory on paper but that reality is different. Mostly the necessary financial means and the political courage are lacking in these countries. A right step in this context is the creation of official captive breeding projects in their native countries and in the West (pers. comm. Singh S., Lucknow, India (1988)). Such an undertaking deserves great financial inputs, applied knowledge and the full devotion of competent people.

In summary it might be stated that under the present circumstances the members of the genus *Tragopan* are getting more and more rare in the wild due to the progressive loss of their habitat. For *melanocephalus, blythi* and *caboti* the situation is already critical. In the long term it looks like these birds can only be preserved under captive conditions. However, the 100-years avicultural experience in the West shows that a similar problem is present here due to the systematic loss of the genetic variability.

It is therefore imperative that a scientifically based effort is made involving individuals and institutions including C.I.T.E.S., on an international level to make it possible to maintain the gene pools of all the species in captivity.

3. TRAGOPAN HYBRIDS

During the seventies and eighties several well-known breeders in the Benelux and in other countries have produced hybrids from *satyra/temmincki* on one hand and from *temmincki/caboti* on the other. It is unfortunate that these birds have been passed on to others.

In the early seventies several pheasant breeders in Europe and North America

crossbred *satyra* and *temmincki* (Sivelle 1979) (Van der Mark 1979). Specially *temmincki* showed signs of *satyra*- blood. These hybridizations were merely a result of the shortage of the suitable partners. Many breeders who were not able to find a new male *temmincki* for their free female *temmincki* found it expedient to use a male *satyra* (pers. comm. Sivelle C., N.Y. U.S.A. (1978)). The result of these uncontrolled mixings was dramatic : production of F1/F2/F3 *temmincki*- hybrids with traces of *satyra*. It goes without saying that in those days (1972-1982) it was difficult to distinguish between pure and non-pure *satyra* and *temmincki* females. In case of selective hybridizations it was extremely difficult to distinguish and to identify pure and non-pure bred females (pers. comm. Houpère-Lastère, Paris, France (1979)).

F1 hybrid males were systematically and conveniently eliminated as in juvenile males the heterozygote features could easily be demonstrated. Above all, most of the hybrid females were retained and used for captive breeding purposes. In juvenile females this hybridization was hard to detect due to the less distinct and modest overall brown feather patterns. However, the heterozygote features reappeared in an uncontrolled way in the feather patterns of their juvenile and adult sons and grandsons. Pure-bred females *temmincki* were very hard to find in those days. Consequently, the breeder did not have the necessary 'in vivo' reference material at his disposal and the confusion became legion.

Happily, the problems that were caused by these sinister activities, were removed by the early eighties when pure bred *temmincki* offsprings were shipped from the San Diego Zoo, U.S.A. (Driscoll C., U.S.A., 1988), from the formerly Sivelle-Smith Aviaries, U.S.A. , (pers. comm. Smith M., N.Y., U.S.A., 1987); from Howe G., Canada (pers. comm. Howe G., Aylmer, Canada), from Weise W., West-Germany (pers. comm. Weise W., Hambuhren, West-Germany (1989)) and others into the Benelux.

In case of *satyra* these mixed-blood problems began disappearing by the early seventies when new imports of wild-caught birds were shipped from Kathmandu, Nepal and New Delhi, India into the Benelux (Van der Mark (1979)).

Similar crossbreedings as described were carried out since 1987 in the Benelux and in the D.D.R. for *temmincki* and *caboti* (pers. comm. Weekers, H., Holland 1988). Pure males and females of *temmincki* which began producing well in the Benelux since 1985, were used wittingly or unwittingly to improve the reproduction of the rare *caboti.* In 1989 these undertakings prove to be illusory as indiscriminate mixing of *temmincki/caboti* produced hybrids in the F1 generation with having a phenotype that is quite similar to that of a pure *temmincki* (pers. comm. Grummt G., Berlin, D.D.R. 1989).

We have personally seen hybrid males systematically disappearing while hybrid females were kept and moved as pure-bred birds. The present confusion in pheasant circles is greater than it was ever before due to the broader phenotypical differences between pure hens of *temmincki* and *satyra* than between pure hens of *temmincki* and *caboti.* Not surprisingly these *Tragopan*- females caused sensation in the Benelux (in litt. Weekers H. (1989)).

In England, Howman K. (pers. comm. Howman K., Middlesex, England, (1986)) crossbred *blythi* with *satyra* and Wayre P. crossbred *melanocephalus* with *temmincki*

(in litt. Wayre P. (1977)) (Van der Mark R.R.P., (1979)) in the course of the last fifteen years in order to improve the reproduction chances from both species. In Holland Steenbeek G. mixed *blythi* with *satyra* (in litt. Weekers H., (1989)). These hybridization-experiments have been described in extenso by Van der Mark R.R.P., (1979) in his monograph 'Tragopan'. It is believed that hybrids with *blythi* and *melanocephalus* have not been passed on to others. Hybrids from both species are currently not available.

4. WHY 'CROSSBREEDING' WHEN 'NON-CROSSBREEDING' IS THE GENERAL RULE ?

The hybridizations are directly connected with the rarity of these birds due to the restrictions applied by the C.I.T.E.S since 1976 and as also the inadequate knowledge and commercial aspirations of some of the former and present holders.

Various authors write that the hybridization of the five species of *Tragopan* produces fertile offsprings (Delacour (1977); Wayre (1977); Johnsgard (1986)). These assertions have been confirmed by the breeders and others mentioned above. For the true and sincere aviculturist these hybrids are without any value as within captive breeding circles the preservation of the purity and genetic variability are of utmost importance. Hence the undesirable and deleterious crossbreeding must be avoided at all times.

It is a hopeful sign that discussions in this context have been taking place on higher and lower levels. Nevertheless, it is a pity when worthless hybrids or pure-bred specimens are silently spread around as subsitutes and finally arrive in the hands of innocent and non-suspecting people. Also when doubts (namely that females that belong to different *Tragopan* species are undistinguishable) are expressed by the so-called specialists and consequently find favorable response in official institutions which are responsible for the protection of these birds.

In an attempt to counteract such misinformation, we should take up the responsibility to change matters in order to safeguard our hobby and to preserve these beautiful and rare birds. As a first step, it is important to identify characters by means of which the hens of all the five species can be distinguished.

5. PRACTICAL WAYS TO DETERMINE TRAGOPAN FEMALES

In the present context, it is desirable that both the breeders and the C.I.T.E.S. authorities should be able to identify the females. Although males and females are highly dimorphic, the differences among the various hens are not always very clear; particularly *caboti* and *temmincki* on one hand and *blythi* and *satyra* on the other.

Quite precise phenotypical descriptions of *Tragopan* females have been available for almost 30 years; chiefly those from Delacour (1951), the inspirator of the World Pheasant Association and yearly long president of this organization (a.o.) himself. His descriptions have been modified by Johnsgard (1986). An attempt is made here to

differentiate between the females of the various species based on the older descriptions in literature and personal examination of specimens present in the Natural History Museum in Tring, Herts, England and in the Royal Belgian Institute for Natural Sciences (KBIN), Brussels, Belgium and of the live birds in private collections in North America, Europe and Asia and in the authors' collection. These descriptions will be supported by pictures (see Figures 2-23) that the breeders and C.I.T.E.S.-officer have a practical and reliable identification tool at their disposal.

5.1. A Key to the females of the genus Tragopan (according to Delacour 1951)

Delacour has provided a handy key for the hens of the genus *Tragopan* based on adult characters (more than 18 months).

(1) Grey breast and abdominal parts with small round white spots .....**melanocephalus**
Brown breast and abdominal parts with oval and lanceolate markings .....(2)

(2) Breast and abdominal parts with lanceolate markings ..... (3)
Breast and abdominal parts with large oval markings ..... (4)

(3) Markings finer and lighter.....**satyra**
Markings coarser and darker.....**blythi**

(4) General colour fulvous brown; markings on dorsal parts brown .....**temmincki**
General colour greyish brown; markings on dorsal parts white .....**caboti**

Delacour reported that there is a great individual variation among the females which might make a right identification difficult :

(1) A female ***melanocephalus*** is always greyer and less heavily marked than all others.

(2) A female ***satyra*** is always more reddish than those of *blythi* and *temmincki* hens. Even is their dull greyish phase, their wings and tail remain brown. Almost always their wing-bend is tinged with orange crimson. Their orbital skin is bluish.

(3) A female ***blythi*** resembles closely *satyra*, but few of them show an orange crimson tinge on the bend of the wing. They are always and decidedly more heavily and evenly marked. They appear generally less reddish, more olive brown, although some very bright specimens are found. Their orbital skin is yellowish.

(4) A female ***temmincki*** is still more coarsely marked above and shows large white blotches below. Their orbital skin is bluish.

(5) A female ***caboti*** is greyer and the light markings on the upperparts are white, not pale buff. Their orbital skin is orange.

5.2. Differentiation by the size and weight of the females of the genus Tragopan

Apart from the above mentioned differences there are still other visual differences among the various hens. Delacour stated the great difference in measures and weights of *Tragopan* females. Similar differences can be found in captive raised birds.

Table 3 : Size and weight of *Tragopan* females (Delacour J., U.S.A., 1977)

Scientific name	Weight (g)	Tail length (mm)
Tragopan melanocephalus	1250 - 1400	190 - 200
Tragopan satyra	1000 - 1200	195
Tragopan blythi	1000 - 1500	170 - 175
Tragopan temmincki	970 - 1100	158 - 178
Tragopan caboti	900	151 - 171

Females of *blythi* and *melanocephalus* are the heaviest birds, followed by *satyra* while *temmincki* and *caboti* are the lightest (see Table 3). In *temmincki* and *caboti* the wing is short while the other three species have a wing longer than 215 mm (see Table 4). The females *blythi* and *melanocephalus* are the tallest followed by *satyra*. The *caboti* being smaller and more compact. The tail of *satyra* is longer than that of the *blythi* through the latter, on average, is a heavier bird. The female of *satyra* has a longer tail and wing and is heavier than that of *temmincki*. Unfortunately these characters are not very helpful in distinguishing *temmincki* and *caboti* for which other characters must be used (seeTables 4,5, 6, 7 and 8)

Table 4 : Orbital skin and wing lengths of *Tragopan* females (Delacour J., U.S.A. 1977).

Scientific name	Orbital skin	Wing length (mm)
Tragopan melanocephalus	orange - red	255 - 290
Tragopan satyra	brown	215 - 235
Tragopan blythi	yellow	232 - 260
Tragopan temmincki	blue	202 - 218
Tragopan caboti	yellow-orange	210 - 215

5.3. Differentiation by the colour of the orbital skin of the females of the genus Tragopan

The colour of the orbital skin in the females of the five species varies as shown in Table 4 but this is true only for hens that are at least 18 months of age. However, the colour of the orbital skin in several juvenile females *caboti* in the author's collection

rather tends to be yellow-blue, while in several juvenile females *blythi* it tends to be green-yellow. One would suspect these to be hybrids through in other characters (see Chapters 5.1; 5.2; and 5.4) they correspond to the pure-bred.

As mentioned earlier the colouration of the orbital skin is directly connected with the age of the birds. Apparently the composition of the available food affects the colour. It has been observed that *caboti* females living in North America do have a slight yellow colour while those in West Europe mostly have a more orange yellow colour. In this context it must be kept in mind that the genetic background of all *caboti* in the West is practically the same for all individuals descended from the same source (the former Pheasant Trust, England). A subject which deserves more attention !

Since the colour of the orbital skin in *caboti* and *melanocephalus* is very similar, we have to depend upon other characters to distinguish between them.

5.4. Differentiation by the incubation data of the females of the genus Tragopan

Delacour has provided data for the size, weight and number of eggs produced in one season by the five species of *Tragopan.*

Table 5 : Weight and size of eggs from *Tragopan* females (Delacour J., U.S.A., 1977)

Scientific name	Weight Egg (g)	Size Egg (mm)
Tragopan melanocephalus	61.3	63 X 42
Tragopan satyra	63.3	65 X 42
Tragopan blythi	62.0	58 X 44
Tragopan temmincki	47.7	54 X 40
Tragopan caboti	53.9	55 X 41

These figures indicate that the eggs of *melanocephalus* and *satyra* are larger and heavier than those of *temmincki* and *caboti.* Van der Mark (1979) writes that the eggs from *melanocephalus* are the most rounded.

According to Delaurier (1907) the eggs of *melanocephalus* and *blythi* are the biggest, followed by those from *satyra* and *temmincki.* These date have been confirmed for most of the available species by Howe G., Canada (1989) (pers. comm. Howe G., Aylmer, Canada 1989) (Allen G. 1986). We have found the smallest eggs in *caboti.* According to our experience pure females of *temmincki* and *caboti* can be differentiated by these data as the egg of *temmincki* has an average weight of 49.3 g while the egg of *caboti* weights on an average 46.2 g. We also found the egg of *temmincki* to be slightly larger (55 x 42 mm) than that of *caboti* (52 X 40 mm). It must be kept in mind that the values are rather indicative as the number of eggs from the more rare captive species were less than 20.

Table 6 : Weight and size of eggs from captive *Tragopan* females (Hermans F., Belgium 1989)

Scientific name	Weight Egg (g)	Size Egg (mm)
Tragopan melanocephalus	65.3	65 X 42
Tragopan satyra	63.3	63 X 42
Tragopan blythi	64.1	64 X 44
Tragopan temmincki	49.3	55 X 42
Tragopan caboti	46.2	52 X 40

The incubation period of eggs varies from 27 to 29 days (Table 7). The eggs were incubated with a Grumbach Compact S72 forced air incubator at a temperature of 37.7 °C and 52.5 % R.H. Two days before hatching the eggs were transferred to another incubator of 75 % R.H. The chicks of *temmincki* and *caboti* hatched at least 24 hours earlier than others.

Table 7 : Incubation data from captive *Tragopan* females (Hermans F., Belgium, 1989)

Scientific name	Incubationtime (days)	number in one season
Tragopan melanocephalus	28 - 29	7 - 12
Tragopan satyra	28 - 29	7 - 12
Tragopan blythi	28 - 29	7 - 12
Tragopan temmincki	27 - 28	15 - 20
Tragopan caboti	27 - 28	15 - 30

The total number of eggs produced by one female in one breeding season under captive conditions in West Europe are shown in Table 7. The number of eggs produced by *temmincki* and *caboti* is much more than the others. It might be said that a hen *caboti* is the best and most regular layer while a female *satyra* is the most unreliable hen.

We also found a difference in the dates on which females belonging to different *Tragopan* species start laying. First to start is *caboti* by the first week of March and *temmincki* a week later. Around the 10th of April *satyra* and *melanocephalus* might start laying. As last candidate comes *blythi* somewhere by the end of April or by the beginning of May (see table 8). Howe (1987) confirms these data.

Table 8 : Dates of egg laying from captive *Tragopan* females
(Hermans F., Belgium 1989)

Scientific name	Earliest dates of laying in Western Europe
Tragopan melanocephalus	10 April - 15 April
Tragopan satyra	10 April - 15 April
Tragopan blythi	25 April - 05 May
Tragopan temmincki	15 March - 30 March
Tragopan caboti	05 March - 15 March

6. OTHER FACTORS TO DETERMINE TRAGOPAN FEMALES

6.1. Source of the birds

It is very desirable to know the source from which the stock birds and their progeny have come, specially for the females. Hence, each breeder should provide all available information and eventually confirm this by the use of written evidences (pedigree-papers; C.I.T.E.S. -importpermits or certificates, breeding loan contracts, etc..) in order to explain the origin of the stockbirds and the youngs. In this context it would be helpful if the birds are legbanded by an official and closed ring. Legbands produced by AVIORNIS International are the obvious means. Tragopans without legbands might be good birds, however, it is much safer to procure birds having official and closed rings.

The purpose of this informationround is to distinguish the false from the true data. Hence that the owner in spe must be able to try out the acquired information. the best is not to rely on rumours or hearsay but rather on the credibility and assistance from a competent and neutral person. In this way the seller has to prove his credibility. The reputation of the breeder is an important consideration.

6.2. Reputation of the breeder

As has been described in chapter 2 it is very difficult to import fresh birds. According to our experience only those people are able to legally import these birds who do have sufficient international contacts. Under the present circumstances it might be said that the legal import of these birds is a difficult undertaking. Hence it is best not to believe the many rumours spread around by the so-called breeders/importers who claim to imported themselves Tragopans from China/India or Pakistan since 1984. For instance, it was rumoured that *temmincki* exported from Pakistan were into Belgium. We do not know one single specimen of *temmincki* occuring nor in the wild nor in captivity in Pakistan. Or rumours such as *caboti* exported from Kuala Lumpur, Malaysia and legally imported via Brussels Belgium, ... don't believe them !

6.3. Assistance from a competent and neutral person

It must be obvious after what has been said in the chapters 6.1. and 6.2. that the acquisition of pure and unrelated Tragopans is a very complex matter. As most breeders wish to obtain young birds, which in the case of a female younger than 18 months of age, are difficult to identify with ease. We advise the beginners only to procure new birds after careful consultation with a competent and neutral person.

It must be borne in mind that the splendid appearance of the stockbirds is no guarantee of its purity and its origin from unrelated parents. Careful examination of the young birds might give a definite answer.

A mistake that is often made by many private breeders in the Benelux lies in the fact that these people identify the *Tragopan* females by association with the accompanying and colourful partner(s). One should be very cautious in accepting any birds on their face value only.

6.4. Examination of the bird

Personal examination of the females is an absolute must and has to be learned by everyone who is concerned with the keeping and breeding of these birds. Knowledge of the behaviour, of the wild-phenotype, of the source etc... are the golden keys. We are convinced from the many more phenotypical differences that do exist to differentiate and determine *Tragopan* hens. Due to the complexity of these matters we have limited ourselves in this article to the items described above. Our experience shows that a combination of the mentioned technics gives a definite answer.

It is a well-known fact that people buy with their eyes. However, it has been proven that relying upon this alone does not end in the acquisition of the right stock. Only a careful and close observation can give satisfactory results.

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