

A new species of *Mimetes* (Proteaceae) from the southern Cape

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A remarkable hitherto unknown species of *Mimetes* not obviously related to any other species in the genus, is here described as *Mimetes chrysanthus*. It is endemic to the Gamka Mountain Nature Reserve, an inselberg near Oudtshoorn in the Little Karoo. The bright yellow flowers appear to be pollinated by sunbirds and carpenter bees.

'n Buitengewone, tot hiertoe onbekende spesie van *Mimetes*, wat ooglopend aan geen ander spesie van die genus verwant is nie, word hier as *Mimetes chrysanthus* beskryf. Dit is endemies tot die Gamkaberg Natuurresewaat, wat geleë is op 'n eilandberg naby Oudtshoorn in die Kleinkaroo. Dit wil voorkom asof die helder-geel blomme deur suikerbekkies en houtkapperbye bestuif word.

Keywords: *Mimetes*, new species, southern Cape

Introduction

Mimetes is a very distinct, highly ornamental genus of the Proteaceae endemic to the south-western and southern Cape. Twelve species are currently recognized, according to recent revisions (Rourke 1982, 1984). The majority of these taxa are uncommon, rare, or endangered and are generally well-known to conservation authorities who frequently monitor known populations. Consequently, the discovery in 1987 of an undescribed *Mimetes* of singular morphology, producing large, exceptionally handsome golden-yellow flowered confluences gave rise to considerable surprise and interest. It is here described as *Mimetes chrysanthus*.

Mimetes chrysanthus Rourke, sp. nov.

Species distinctissima perianthio singulari, segmentis discretis arcuatis proximalibus, cohaerentibus in medio tubis formantibus, secedentibus distalibus, distinguitur. Capitula axillares 25-35 flores habent.

Frutex erectus, sparsus ramosus, 1,5-2 m altus, trunco uno, 40-60 mm in diam. *Rami florentibus* 4-7 mm in diam., dense puberuli, indumentis crispis albidis. *Folia* subpetiolata, petiolus 3-5 mm longus; lamina late lanceolata vel elliptica, 30-45 mm longa, 10-18 mm lata, pubescentia sparsa crispa, demum glabrescentes; callus apicalis interdum bifidus. *Inflorescentia* dense cylindrica 60-90 mm longa, 55-60 mm lata, coma suberecta foliorum reductorum viridium. *Capitula axillaria* 25-35 floribus, folio viridia subtento. *Bracteae involucales* imbricatae arctae; bracteae externae ovato-obtusae vel oblongo-spathulatae, 5-10 mm longae, 2-3 mm latae, dense lanatae proximales, apicibus rotundatis, incrassatis, glabrescentibus. *Bracteae florales* lineares, acutae, 8-12 mm longae, sericeae, apicibus crinitis. *Perianthium* 24-28 mm longum, luteum clarum, in alabastro rectum, curvatum adaxiale ante anthesi sed actinomorphum per anthesin; pars proximalis 8-10 mm longa, segmenta glabra hyalina, discreta basi et extrinseca arcuata; cohaerentia in medio, tubum puberulum 6-8 mm longum facientem; segmenta secedentia distalia, sparse puberula. Limbi lineares, acuti, 3-5 mm longi, glabri. *Stylus* rectus filiformis, 25-35 mm longus, glaber. Stigma 1-1,2 mm longum, lineare, leviter geniculatum proximale. *Ovarium* oblongi-cylindricum, 2 mm longum, puberulum. *Fructus* ovoideus vel cylindricus, 6-8 mm longus, 4-5 mm latus, minute puberulus, glabrescens.

TYPUS. — Cape Province: Gamka Mountain Nature Reserve, head of Tierkloof, W/SW of Bakenskop, 19/4/1988, J.P. Rourke 1907 (NBG, holotypus!; BOL, K, MO, NSW, PRE, S, SAAS, isotypi).

An erect, sparsely branched shrub, 1,5-2 m tall with a single main trunk, 40-60 mm in diam., branching at about 200 mm into a few stiffly erect branches; bark grey, smooth. *Flowering branches* 4-7 mm in diam., minutely and densely puberulous with a white crisped indumentum. *Leaves* subpetiolate, petiolar region 3-5 mm long; blade broadly lanceolate to elliptic 30-45 mm long, 10-18 mm wide, minutely puberulous with sparse crisped pubescence, later glabrescent to glabrous; apical callus usually retuse, occasionally bifid. *Inflorescence* a densely cylindric confluence, 60-90 mm long, 55-60 mm wide, topped with a suberect coma of reduced green leaves. *Axillary capitula* subtended by patent, undifferentiated green leaves; 25-35-flowered, the lowermost capitula usually fewer-flowered than the uppermost. *Involucral bracts* tightly imbricate; outer series ovate-obtuse, becoming oblong-spathulate 5-10 mm long, 2-3 mm wide, densely lanate proximally, apex rounded, thickened, glabrescent; inner series 6-8 mm long, 1-1,5 mm wide, lanceolate acute, densely sericeous; cartilaginous, enlarging 3-4 times and becoming lignified in the post-pollination phase. *Floral bracts* linear acute, 8-12 mm long, sericeous, apices crinite. *Perianth* 24-28 mm long, straight in bud, curving adaxially during anthesis but actinomorphic after anthesis, bright yellow; proximal region 8-10 mm long, segments glabrous, hyaline, free to base but outwardly bowed; cohering and becoming connate in median region forming a densely puberulous tube 6-8 mm long; separating distally, becoming widely splayed and sparsely puberulous; limbs linear, acute, 3-5 mm long, glabrous. *Style* straight, filiform, 25-35 mm long, glabrous, yellow. *Pollen presenter* 1-1,2 mm long linear, slightly geniculate at junction with style; stigmatic groove terminal. *Ovary* oblong-cylindric, scarcely differentiated from style, 2 mm long, puberulous. *Hypogynous scales* subulate, 1-1,5 mm long. *Fruit* an ovoid to cylindric achene, 6-8 mm long, 4-5 mm wide, minutely puberulous to glabrescent. (Figures 2 & 3).

Diagnostic characters

Mimetes chrysanthus is unlike any of its congeners on account of its unique perianth morphology in which the four segments are free and outwardly bowed at the base but then become coherent to form a median tube 8-10 mm long, later separating distally. The multi-flowered axillary

capitula (25 to 35 flowers per capitulum), also distinguish *M. chrysanthus* from related taxa.

Relationships

This exceptionally distinct species is not obviously related to any other *Mimetes* with the possible exception of *M. saxatilis* Phill. which has yellow perianths and 14- to 22-flowered capitula. (In all other *Mimetes* the number of flowers per capitulum ranges from 3 to 14). *Mimetes saxatilis* however, is a coastal species endemic to the limestone hills around Cape Agulhas and its floral morphology differs considerably from that of *M. chrysanthus*.

Discovery

This magnificent *Mimetes* was first collected by Mr Willie Julies, a game guard at the Gamka Mountain Nature Reserve on 7 September 1987. He reported his discovery to the officer in charge, Mr Rory Allardice who made a herbarium collection the following day. This specimen (*Allardice 1729*) was subsequently sent to Mr Jan Vlok of the Saasveld Herbarium who immediately recognized that it was an undescribed species and forwarded it to me in December 1987. In April 1988 Mr Allardice reported that flowering had commenced and on the 19th of April 1988 I made a personal visit to Gamka to examine live populations in the field and collect the material on which this paper is based. (Figure 1).

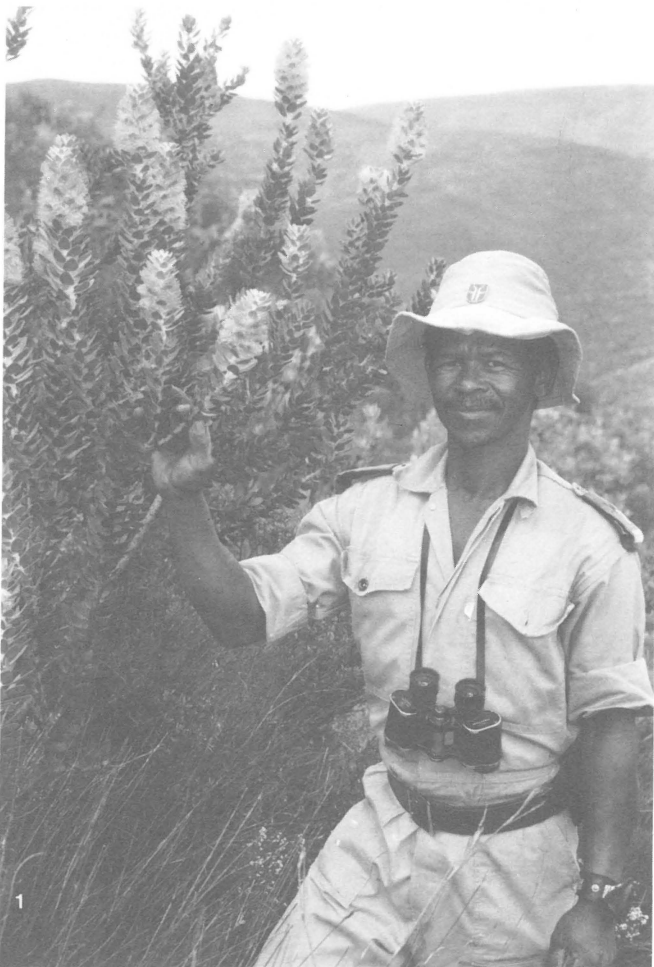
Distribution, habitat and biology

Mimetes chrysanthus appears to be endemic to the 9 500-ha Gamka Mountain Nature Reserve, situated on the south-eastern margin of the Little Karoo. The Gamka Range is a south-easterly prolongation of the Rooiberg but is an inselberg in its own right separated from the adjacent Rooiberg by the deeply incised Gouritz River Gorge.

The majority of populations occur in Dry Mountain Fynbos (Moll *et al.* 1984) on moderately steep south-east facing sandstone slopes of the Table Mountain Group at elevations between 800 and 1 040 m (Figure 4). Seven distinct populations have thus far been discovered, the smallest consisting of four plants and the largest of approximately 500 individuals. Mean annual rainfall at these sites varies from 400 to 450 mm. (Allardice pers. comm.). As the species' entire distribution range falls within a Provincial Nature Reserve, threats to its survival from human factors appear minimal.

Flowering takes place mainly in April and May but probably commences in late March. A few confluences apparently continue to open as late as July. When fully open the brilliant yellow confluences emit a faint sweet perfume reminiscent of the flowers of *Acacia karroo*.

In the post-pollination phase the involucre bracts enclosing fertilized flowers enlarge to almost four times their size at flowering, becoming cartilaginous to woody in texture. The fruits take approximately 8 months to mature and are shed in December (Vlok pers. comm.)



Figures 1 & 2 1. *Mimetes chrysanthus* in the Gamka Mountain Nature Reserve with its discoverer, Mr Willie Julies. 2. *Mimetes chrysanthus*, two mature confluences.

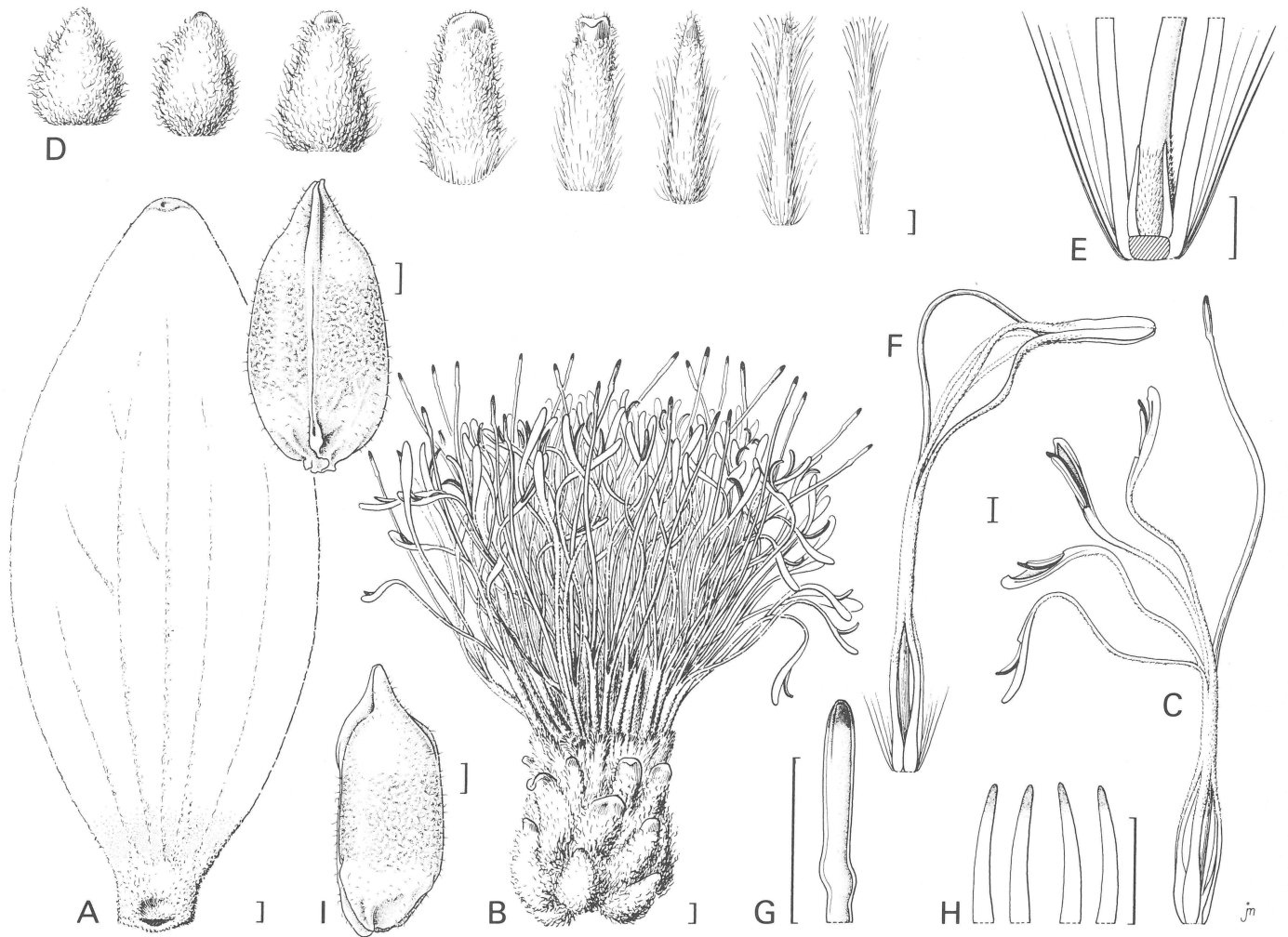


Figure 3 *Mimetes chrysanthus*, (A) mature leaf; (B) axillary capitulum; (C) single flower at anthesis; (D) involucre bracts from outer (L) to inner (R) series; (E) gynoecium showing ovary and hypogynous scales; (F) single flower before anthesis; (G) pollen presenter; (H) hypogynous scales; (I) fruit. Scale line equals 1 mm. (All from *Rourke 1907*).

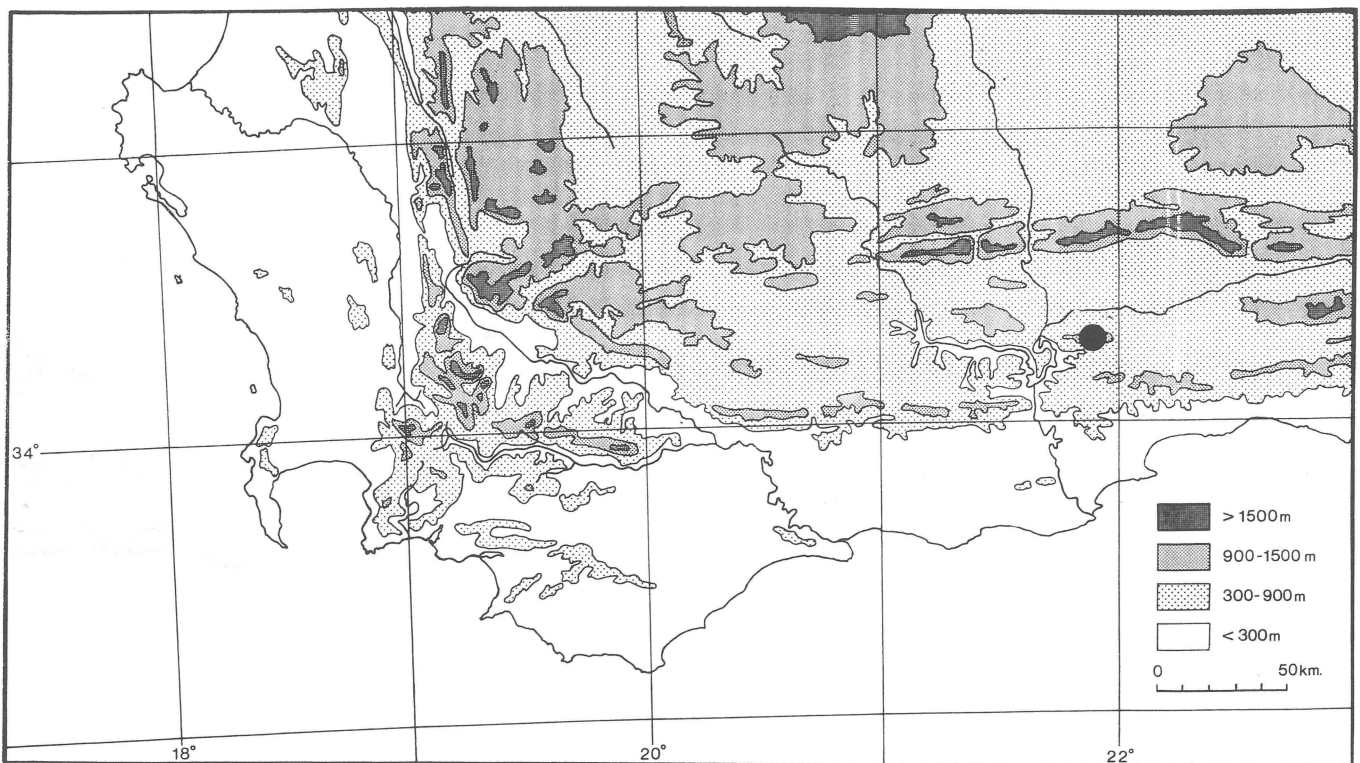


Figure 4 Distribution of *Mimetes chrysanthus*.

Specimens examined

—3321 (Ladismith): Gamka Mountain Nature Reserve, SE slopes of Suurkop, in one of the tributaries of Waterkloof (–DB), 8/9/1987, Allardice 1729 (SAAS); SE slopes of Suurkop, 8/12/1987 (in seed), Viviers & Vlok 1571 (SAAS); Gamka Mountain Nature Reserve, head of Tierkloof, W/SW of Bakenskop, 19/4/1988, Rourke 1907 (BOL, K, MO, NBG, NSW, PRE, S, SAAS).

Pollination

Orange-breasted sunbirds (*Nectarinia violacea*) and carpenter bees (*Xylocopa capensis*) were observed foraging in the confluences of *M. chrysanthus* during midday on the occasion of my visit. The carpenter bees were numerous and especially active. Foraging on the confluences by Cape sugarbirds (*Promerops caffer*) has been reported (Allardice pers. comm.), though not observed by me.

Nectar is produced at the base of each flower but in such minute quantities that it seems unlikely to be the main attractant. Moreover, direct access to the nectar source from above is impeded by the perianth segments cohering around the style. Thus the very limited nectar source can only be reached through the outwardly bowed perianths at the base of each flower.

Pollen, however, is produced in exceptionally large quantities when compared with other *Mimetes* as there are between 50 and 70 axillary capitula per confluence and between 25 and 35 flowers per capitulum. Pollen appears to be the major attractant produced by the uniformly bright yellow brush-type confluences. Yellow is known to be a

bee-attracting colour (Faegri & van der Pijl 1976). The pollination syndrome of this species as well as the observed activity of carpenter bees suggests that *M. chrysanthus* may be largely bee pollinated rather than bird pollinated, as is the case in the majority of other *Mimetes*. This problem requires further detailed investigation.

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Voorskrifte aan Outeurs

Redaksionele beleid: Die volgende tipe artikels sal deur die Tydskrif op die gebied van Plantkunde vir publikasie aanvaar word:

Navorsingsartikels: Alle bydraes moet op oorspronklike navorsing gebaseer wees. Dit mag nie reeds elders vir publikasie oorweeg word nie en dit moet 'n besliste bevordering van kennis in 'n bepaalde gebied behels. Die manuskrip behoort gewoonlik (a) 'n bepaalde probleem of hipotese aan te spreek; (b) verduidelik hoe herhaalbare data bekom is om die probleem op te los of die hipotese te toets; en (c) tot 'n gevolgtrekking kom. (Die feit dat niemand vroeër 'n besondere aspek soos die chemiese samestelling, of morfologie of spesiesamestelling of enige ander aspek van 'n plant of plantgroep ondersoek het nie, sal nie die manuskrip om die bepaalde rede vir publikasie laat kwalifiseer nie, tensy dit sou lei tot 'n besondere bevordering van ons wetenskaplike kennis).

Kort mededelings: Dieselfde vereistes word gestel as vir navorsingsartikels, maar hierdie kort navorsingsartikels behoort nuwe en sinvolle resultate te bevat wat spoedige publikasie regverdig wat dalk later in 'n vollediger artikel kan verskyn.

Oorsigartikels: Oorsigartikels sal aanvaar word indien die skrywer die data van ander outeurs opsom en krities evalueer en (a) tot 'n nuwe gevolgtrekking kom wat die probleme wat ondersoek is betref; of (b) leemtes in ons kennis identifiseer wat addisionele navorsing regverdig. Medewerkers word aangeraai om 'n uiteensetting aan die Wetenskaplike redakteur aan te stuur voordat die oorsigartikel geskryf word.

Boekbesprekings: 'n Kort, objektiewe evaluering van boeke wat onlangs gepubliseer is, sal deur die wetenskaplike redakteur aangevra word.

Briewe aan die Redakteur: Kritiek of kommentaar op enige artikel wat onlangs in die Suid-Afrikaanse Tydskrif vir Plantkunde verskyn het, sal volgens die diskresie van die wetenskaplike redakteur, gepubliseer word.

Die Suid-Afrikaanse Genootskap van Plantkundiges en Nasionale Botaniese Tuine behou kopiereg oor bydraes wat in die Tydskrif gepubliseer is, maar die outeurs dra volle verantwoordelijkheid vir die feitelike korrektheid van die artikel.

Bydraes kan in Afrikaans of Engels geskryf word maar moet 'n uittreksel in beide tale bevat. Die redaksie sal Engelse opsommings van oorsese medewerkers gratis in Afrikaans vertaal. Elke manuskrip sal krities maar streng vertroulik, deur twee of meer vakkundiges beoordeel word. Alvorens die redaksie oor die aanvaarbaarheid van die artikel sal besluit.

Outeurs moet na die manuskriptonummers in alle korrespondensie verwys en moet ook daarop let dat, vanweë probleme met onvoldoende bergingsruimte, die artikel drie maande nadat dit gepubliseer is, vernietig sal word. Outeurs wat oorspronklike tekeninge terug wil hê, moet die Buro vir Wetenskaplike Publikasies persoonlik daaronder nader.

Aanbieding: Manuskripte moet dubbel gespaseerd slegs op een kant van A4 papier getik word met 'n 30-mm-kantruimte links. Vier duidelike eksemplare moet ingedien word. Fotos moet in vieruold ingedien word maar in die geval van lyntekeninge is die oorspronklike plus drie duidelike ligafdrukke voldoende.

Die manuskrip moet soos volg uitgelê word: 'n Titelbladsy met die titel, outeur(s) se naam (name), adres(se), albei uittreksels en die sleutelwoorde daarop. Beginnende op 'n nuwe bladsy volg die Inleiding, Materiaal en Metodes, Resultate, Bespreking, Erkenning, Verwysings, Tabela, Onderskrifte van Figure en die Figure self. In die geval van 'n Kort Mededeling moet die opskrifte Inleiding, Materiaal en Metodes, Resultate en Bespreking, nie gebruik word nie. Alle bladsye, figure en tabelle moet opeenvolgend genommer word.

Titel: Dit moet kort en saaklik wees maar oor genoeg inligting beskik vir suksesvolle ontsluiting deur moderne opspooragnette. Behalwe in die geval van sekere taksonomiese artikels moet takson-name nie van outeursite vergesel wees nie.

Outeur(s): Vanne moet slegs deur voorletters voorafgegaan word behalwe in die geval van dames waar een voornaam uitgeskryf mag word.

'n Adresverandering moet deur middel van 'n voetnota aangedui word.

Uittreksels: Dit behels samevatting van die artikel in nie meer as 200 woorde elk waarin die titel nie mag verskyn nie. Artikels wat in Afrikaans geskryf is moet van 'n bykomstige uitgebreide opsomming in Engels voorsien word ten einde die inligtingsontsluiting vir internasionale samevattingagentskappe te vergemaklik.

Uittreksels mag slegs inligting bevat wat in die artikel voorkom. Taksonname tesame met hul outeursite moet in die uittreksels verskyn behalwe as te veel name betrokke is in welke geval slegs die belangrikste taksons genoem moet word.

Sleutelwoorde: Hoogstens vyf sleutelwoorde moet in alfabetiese volgorde in Engels voorsien word.

Inleiding: Hierin moet die probleem in breë trekke gestel word en die doel van die navorsing verduidelik word. Vermelding van vorige werk is alleenlik wenslik as dit direk met die onderwerp van die bydrae verband hou of die noodsaaklikheid van verdere ondersoek beklemtoon. 'n Uitgebreide literatuurorsig is gewoonlik onvanpas.

Prosedure of Metodes: Saaklikheid is noodsaaklik maar genoeg besonderhede moet verstrek word om die werk te kan herhaal. Bronvermelding van materiaal wat gebruik is, is dikwels belangrik, veral in die geval van lewende organismes. Erkende benamings en afkortings kan vir standaardmetodes, chemiese verbindinge, hormone, ensieme, ens. gebruik word. Verwys na 'n beskryfde metode deur middel van 'n verwysing tensy die betrokke beginsel onduidelik is in welke geval dit toegelig behoort te word.

Resultate: Die belangrikste bevindinge moet in die teks uiteengesit word met verwysing na ondersteunende tabelle, diagramme en/of illustrasies. Die inhoud van tabelle hoef nie in die teks beskryf te word nie.

Bespreking of Gevolgtrekkings: Soms is hierdie opskrifte onnodig. Die tweede opskrif is paslik wanneer die afleidings in 'n paar sinne saamgevat kan word. Onder die eerste opskrif moet die vernaamste resultate krities en in 'n logiese volgorde bespreek word en afleidings daaruit gemaak word; resultate wat op die wenslikheid van 'n nuwe benadering dui moet uitgewys word; aandag behoort op die implikasies

van die resultate asook op ooreenkomste met, of verskille van, vorige werk gevestig te word. Die bespreking moet nie bloot 'n hergerangskikte herhaling wees van wat in voorafgaande afdelings aangebied is nie.

Erkenning: Dankbetuigings moet tot die minimum wat deur hofflikheid vereis word, beperk word.

Verwysings: Verwysings na die literatuur moet as volg in die teks aangehaal word: 'Volgens Reyneke & Visser (1974) het die . . . ' of ' . . . verskil in blaarvorm (Reyneke & Kok 1976).' As meer as twee outeurs in 'n verwysing betrokke is, moet die van van slegs die eerste outeur, gevolg deur *et al.* en die datum, as aanhaling gebruik word.

'n Lys van alle publikasies waarna daar in die teks verwys word, moet op 'n aparte bladsy aangebied word. Die verwysings moet alfabeties volgens outeurs gerangskik word.

Indien daar meer as een verwysing vir 'n betrokke outeur per jaar is moet hulle chronologies gerangskik word deur die letters a, b, c, ens. na die jaartal te plaas. 'n Persoonlike mededeling moet in die teks vermeld word en nie in die lys van verwysings aangehaal word nie.

Soos hieronder aangedui word, moet outeursname in die verwysingslys in hoofletters getik word.

CODD, L.E. 1975. *Plectranthus* (Labiatae) and allied genera in Southern Africa. *Bothalia* 11: 371-442.

JONES, E.P., SMITH, P. & MASTERS, O. 1974. Methods in photosynthesis. In: Methods in plant physiology, red. Sykes, J.P. 2e uitgawe, Vol. II, Hfst. 8, Longman, Londen.

VILJOEN, P.J.C. 1953. Die embriologie van enkele onkruidspesies. M.Sc-verhandl., Univ. van Onseepkans.

Titels van tydskrifte, afgekort volgens die mees onlangse uitgawe van 'World List of Scientific Periodicals' asook Latynse name en frases moet onderstreep word.

Tabelle: Vanweë hul hoë drukkoste moet die aantal en grootte van tabelle tot die minimum beperk word. Tabelgegewens moet nie in grafiekvorm herhaal word nie. Elke tabel moet op 'n aparte vel getik word en opeenvolgend, soos daarna in die teks verwys, met Arabiese syfers genommer word. By die opstel van tabelle moet daar met die grootte van die gedrukte bladsy rekening gehou word. 'n Asterisk moet slegs gebruik word om statisties-betekenisvolle verskille aan te dui. 'n Voetnota moet d.m.v. 'n kleinletter wat as eksponent aangewend word, aangedui word.

Illustrasies: Illustrasies moet apart van die teks ingedien word. In die teks word daarna as 'Figuur X' verwys. Dieselfde reëls vir die nommering van tabelle geld ook vir figure. Fotos moet van hoogstaande gehalte wees, voldoende kontras besit, besonderde duidelik toon en op glanspapier afgedruk wees. Tekeninge, diagramme, grafieke ens. moet die oorspronklikes insluit en moet met Indiese ink op goeie kwaliteit papier soos bv. 'Bristol Board' of atreppapier geteken word. Ligafdrukke kan nie vir die finale drukproses gebruik word nie. 'n Illustrasie moet nie sy verwagte finale grootte met meer as tweekeer oorskry nie. Laat ruimte vir die onderskrif in gevalle waar 'n volbladillustrasie beoog word.

Lyne en simbole op figure moet sodanig wees dat hulle na verkleining nog bevredigend sal vertoon.

Vergrotings aangedui by figure, moet op die grootte waarin die figure ingedien word, van toepassing wees. Die gebruik van 'n skaalbakie op die figuur self word egter sterk aanbeveel.

Die plek waar outeurs die betrokke figure en tabelle in die teks wil hê moet duidelik met potlood aangedui word.

Agtër op elke figuur moet die naam van die outeur, die nommer van die figuur asook die bopunt van die figuur met 'n sagte potlood aangebring word.

Figuuronderskrifte moet almal saam op 'n aparte bladsy met die opskrif 'Figuuronderskrifte' getik word. Die onderskrif sowel as enige byskrifte wat op die finale figuur moet verskyn, moet netjies op die ligafdrukke van die oorspronklike figuur getik word of in drukskrif daarop aangebring word.

Taksonomiese artikels: 'n Handleiding vir die skryf van taksonomiese artikels het in Volume 53, Nr 1 verskyn. Medewerkers kan aan die Wetenskaplike redakteur skryf ten einde 'n kopie van die vereistes te bekom en moet daarop let dat artikels wat nie volgens die handleiding geskryf is nie, nie vir publikasie oorweeg sal word nie.

Algemeen: Waar 'n organisme vir die eerste keer in die teks genoem word moet sy volledige wetenskaplike naam (genus, spesie en outeur) gegee word en indien enigsins moontlik moet outeurs (ook die wat oor eksperimentele werk berig) na 'n verwysings-herbariumvel van die betrokke plant(e) in 'n geregistreerde herbarium verwys. Hierna mag die genusnaam deur sy eerste letter aangedui word mits daar nie ander genusse met dieselfde afkorting tussenin gebruik word nie. Wetenskaplike name van genusse, spesies en subspesifieke kategorieë moet onderstreep word ten einde kursiefdruk aan te dui. Name van taksons bo die genusvlak moet nie onderstreep word nie. Enige ander merke op die manuskrip moet aan die redaksie oorgelaat word.

Slegs SI-eenhede mag gebruik word. Voetnotas moet sover moontlik in die hoofteks vermy word deur van hakies gebruik te maak. Op die titelblad, waar 'n adresverandering van 'n outeur aangedui moet word, is voetnotas egter toelaatbaar.

Oordrukke: 50 oordrukke word gratis verskaf. Al die kort mededelings van een tydskrifuitgawe word saam as 'n enkele vollengte artikel vir oordrukdoeleindes hanteer. As daar vier kort mededelings in 'n uitgawe is, sal daar dus 25 oordrukke van elk gratis voorsien word.

Manuskripte moet vir publiserings voorgelê word aan: Die Wetenskaplike Redakteur, Prof. J.N. Eloff, Nasionale Botaniese Tuine, Privaatsak X7, Claremont 7735. Teleks 521812

Voorskrifte aan outeurs verskyn beurtelings in Afrikaans en Engels. Instructions to authors appear alternately in Afrikaans and English.