



Research paper

The similarities between the World Federation of Acupuncture-Moxibustion Societies' standards for auricular acupuncture points and the European System of Auriculotherapy Points according to Nogier and Bahr[☆]



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ABSTRACT

Introduction: Basic and clinical research on auricular acupuncture points (AAPs) was performed in China, the United States, France and Germany. Clinical auricular acupuncture point (AAP) research was done in Italy, Austria, Switzerland, Spain, the UK, Holland, Japan, Russia, and Africa. This paper is aimed at investigating the similarities of WFAS standard of auricular acupuncture points (AAPs) and European system of AAPs according to Nogier and Bahr.

Methods: Similarities were analyzed from the perspective of name and location of auricular acupuncture points, taking the standards of the World Federation of Acupuncture-Moxibustion Societies (WFAS)-Auricular Acupuncture Point, and the European system of auricular acupuncture according to Nogier/Bahr as a reference.

Results: The location of the acupoints associated with the locomotor system, including shoulder, wrist, elbow, finger, pelvis and buttock, were similar. The reflexed gastrointestinal system on the auricle, including stomach, esophagus, duodenum, small intestine, large intestine, appendix, liver, gallbladder and pancreas were also similar, as were the mapping for the urogenital system, including the ureter, urinary bladder, prostate and urethra. For the head region, only the eye point is similar but for the nervous system, including the temple, occiput, sub-cortex and endocrine, locations were similar. An additional twenty-five sub-areas or points, named by the auricular anatomical name, can be listed internationally as more widely acknowledged points.

Conclusion: There are twenty-four auricular acupuncture points sharing the same name and similar locations, and twenty-five sub-areas or points which share the auricular anatomical name with different reflexed parts of the body and different therapeutic effects.

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1. Introduction

1.1. Auricular acupuncture in ancient China

There is a long history of the use of auricular points to diagnose and treat disorders in China. More than two thousand years ago,

Chinese ancestors discovered a relationship between some disorders and the auricle. During the Spring and Autumn and the Warring States periods (770BC–221BC), the *Eleven Moxibustion Channels* (*yinyang shiyi mai jiu jing*) defined the relationship between the auricle channel (later developed into the hand Shaoyang channel) and the upper limb, eye, cheek and throat. During the Qin and Han Dynasties (221BC–220AD), *Huangdi's Internal Medicine* (*huangdi neijing*) [1] discussed the relationship of the ear and meridians, diagnosis of diseases through inspection of the ear, and the treatment of cramp by bleeding of the posterior auricle. In the Tang Dynasty (618AD–907AD), the ear center was first mentioned in Sun Si-miao's *Important Formulas Worth a*

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Thousand Gold Pieces (qian jin yao fang) [2], which was published in 652AD. This book also described the treatment of jaundice using auricular points. The ear apex was first mentioned in *Essentials from the Silver Sea (yin hai jing wei)* [3], a book on ophthalmology from the Ming Dynasty (1368AD–1644AD). The location of the ear apex was first mentioned in *The Great Compendium of Acupuncture and Moxibustion (zhen jiu da cheng)* [4], published in 1601AD. In the Qing Dynasty (1636–1912AD), Wang Hong's *Inspection Principle (wangzhen zunjing)* [5] contained a special chapter devoted to "diagnosis from inspection of the auricle" focusing on auricular diagnosis and treatment, from the perspective of discoloration and deformity based on the theory of traditional Chinese medicine. He proposed that the different discolorations correspond to the five phases (wu xing) and to the five zang-organs.

In terms of the first auricular map in China, the theory that each of the five areas of the posterior of the auricle correspond to each of the five zang-organs (heart, liver, spleen, lung and kidney) was put forward in Zhou Yufan's *Massage Technique for Children (xiaoer anmo shu)* during the Ming Dynasty (1368AD–1644AD). In 1888, at the end of Qing Dynasty, Zhang Zhenjun, in his book, *Essential Techniques for Massage (lizheng anmo yaosu)* [6], discussed this theory. He also drew the world earliest known auricular map (Fig. 1). Although initially, only a small number of auricular nomenclatures and scattered locations were mentioned, it gradually developed into a full system of auricular diagnosis guided by holistic medicine thinking. The experience accumulated during this process laid a solid foundation for the modern system of auricular diagnosis and treatment.

1.2. Auricular acupuncture in Europe

Egyptologist Alexandre Varille (1909–1951) documented that women in ancient Egypt used needles or cauterization on the external ear for birth control [7]. In ancient Greece, the famous physician, Hippocrates (460BC–370BC) reported that bloodletting from behind the ear reduced impotency problems and facilitated ejaculation [8]. The Greek physician Galen introduced Hippocratic medicine to the Roman Empire in the second century and commented on the healing value of scarification of the outer ear. Later, the Dutch painter Hieronymus Bosch (1450–1516) clearly depicted ear acupuncture in his famous Triptychon "Garden of Desire" [9], which can be visited in Madrid's Prado Museum. In 1956, the theory of the inverted fetus on the auricle [10] was presented by Dr. Paul Nogier at the Mediterranean Conference of Acupuncturists. G. Bachmann, editor of the German Journal of Acupuncture (*Deutsche Zeitschrift für Akupunktur*), reported these findings, which allowed the introduction of the scheme of the inverted fetus to China. In 1958, Dr. Ye Xiaolin published an article entitled "The New Finding of Acupuncture Abroad" in the *Journal of Shanghai Chinese Medicine* [11].

Dr. Nogier's most important disciple is Prof. Frank Bahr of Munich, who studied with him and, together with Dr. Nogier and Dr. Bourdiol, defined the famous auricular chart "Loci Auriculo-Medicinae" in 1974 (Fig. 2). It was Paul Nogier and later Frank Bahr who showed that the ear has a so-called Somatotopy, meaning that the whole person is represented on the ear, including anatomical, psychic and functional points. The comprehensive method of Auriculomedicine was born, with which it is possible to diagnose and to treat the whole patient solely on the ear. In 2010 the first systematic book on European auricular acupuncture (*Das grosse Buch der Ohrakupunktur* by Bahr and Strittmatter) was published in Germany [8].

The phase theory [12] was proposed by Paul Nogier in the early 1980s. Based on this theory, the corresponding parts of the body belonging to the endoderm, mesoderm and ectoderm were projected onto different zones of the auricle in the three Phases,

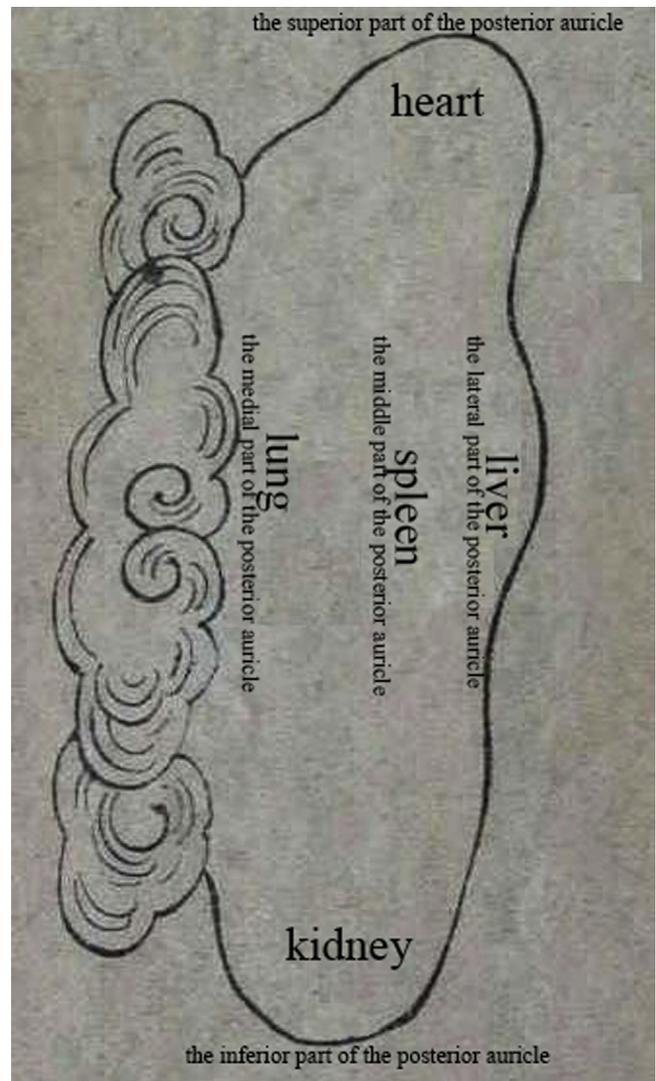


Fig. 1. The Posterior Auricular Map (The first auricular map in Chinese history). Note: The picture is from Zhang Zhenjun's book, *Essential Techniques for Massage (lizheng anmo yaosu)*. The superior part of the posterior auricle corresponds to heart, the inferior part corresponds to kidney, the middle part corresponds to spleen, the lateral side corresponds to liver, and the medial side corresponds to lung.

Phase 1, 2 and 3 respectively. For example, the lung in Phase 1 was located in the inferior concha, in Phase 2 at the lobe, in Phase 3 in the scapha. Therefore, some organs are represented at more than one location on the ear. The first pocket atlas of ear acupuncture according to Nogier/Bahr by Strittmatter [13] was published in the German language in 2001. Since the publication of this book, the phase theory has rarely been mentioned and one corresponding part of the body was projected onto one zone on the auricle. For example, the lung was located in the inferior concha. The English editions of the atlas were published in 2002 and 2011.

Basic and clinical research on auricular acupuncture points (AAPs) has been performed in China, the United States, France and Germany. Clinical auricular acupuncture point (AAP) research was carried out in Italy, Austria, Switzerland, Spain, the UK, Holland, Japan, Russia, and Africa [14]. The development of the international standardization of AAPs has been, and continues to be, a long process (Table 1). According to a report from the World Health Organization (WHO) Regional Office for the Western Pacific in Manila in 1988 [19] looking into the comparison of the consensus

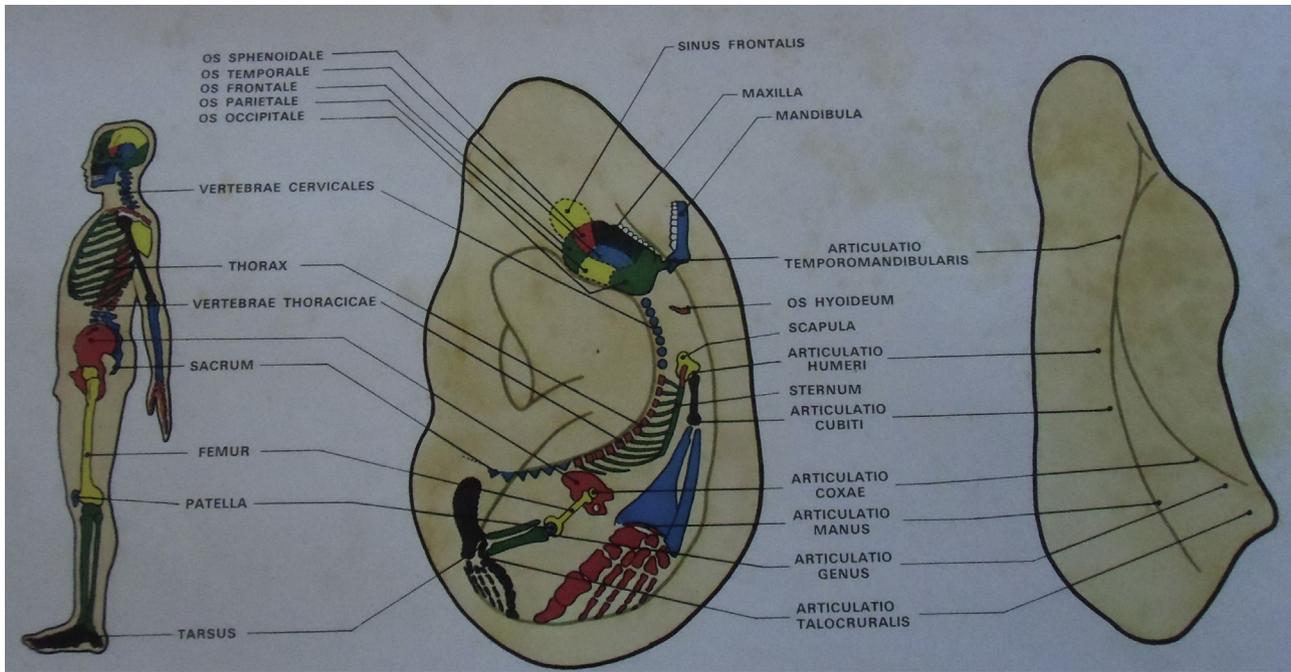


Fig. 2. Prof. Frank Bahr's Auricular chart in 1974.

Note: The picture is the mapping of the locomotor system of Prof. Frank Bahr's auricular chart. The first English/Chinese auricular chart with the Somatotopy was published in 2012. The second English/Chinese auricular chart with additional psychic points and all the meridians on the ear was published in 2013.

Table 1

The conferences which developed the international standardization of auricular acupuncture points.

Year	Place	Conference
1982	Manila, Philippines	The World Health Organization (WHO) Regional Office for the Western Pacific initiated the international standardization of acupoints [15].
1984	Tokyo, Japan	The first regional conference of the working group of the standardization of acupoints was organized by the WHO Regional Office for the Western Pacific [16].
1985	Hong Kong	In the second regional conference of the working group of the standardization of acupoints [17], Chinese delegates proposed that the draft of nomenclature of AAPs should be discussed as a next step due to the necessity of further development of auricular acupuncture.
1987	Seoul, South Korea	The third regional conference of the working group of the standardization of acupoints was held in Seoul, South Korea in 1987 [18]. In this conference, the China Association of Acupuncture-Moxibustion (CAAM) put forward a draft of international standard of AAPs including ninety points. The draft was seriously discussed and the board set up 3 criteria of selection: <ol style="list-style-type: none"> (1) Points which use international and common names; (2) Points whose therapeutic values are well proven; (3) Points whose location in the auricular area appear to be generally well-defined. Based on these criteria, forty-three points of the ninety points reached the criteria; thirty-six points partially meet the first and second criteria and eleven points were rejected.
1989	Geneva, Switzerland	The fourth regional conference of the working group of the standardization of acupoints was organized by the scientific group of WHO [20]. The report mentioned that some additional aspects of the standard international acupuncture nomenclature still remain to be considered, notably with respect to auricular acupuncture (e.g., the forty-three AAPs of proven therapeutic value, the location of which is generally accepted.) and the basic technical terms used in acupuncture.
1990	Lyon, France	The fifth conference of the working group of the standardization of AAPs was held [21]. On the basis of the consensus of the third conference in 1987, thirty-nine AAPs were approved. At the same time, each anatomical structure of the auricle was named by two letters, which was the same as traditional acupoints. For example, HX (not H) was short for helix, LO (not L) is short for lobe. The working group also suggested that a standard picture for reference be made, in which people could see correct anatomical areas.
2010	Beijing, China	The sixth conference of the working group of nomenclature and location of AAPs was held in Beijing, China in 2010 [22]. It was organized by the World Federation of Acupuncture-moxibustion Societies (WFAS) and co-organized by Auricular Diagnosis and Treatment committee of CAAM. There were eleven delegates from China, America, Germany, South Korea and Canada attending the meeting.

of the 1987 conference, the report demonstrated an auricular anatomical area chart and an auricular points chart with the forty-three international AAPs marked in an alphanumeric way and presented them without the term microacupuncture, MA, before each of the forty-three international AAPs. In 2009, the World Federation of Acupuncture-Moxibustion Societies (WFAS) continued the work of international standardization of AAPs. There were three resolutions made during the 2010 Beijing Conference [22]: (1) On the basis of the previous twenty years of research and effort by the WHO, the draft proposed by China is more comprehensive, systematic and normative, which is a great improvement; (2) Through overall discussion and consultation, the standardization of nomenclature and location of AAPs will undergo discussion on the basis of the draft proposed by WFAS; (3) The symposium has clarified the mechanism of the work in the future of international standardization of nomenclature and location of AAPs. The delegates suggested that a network or forum be established in order to further cooperate and communicate. In 2013, the international standards for Auricular Acupuncture Points was issued by WFAS [23].

In the year 2009 Prof. Wang Wei of Beijing University of Chinese Medicine (BUCM) and Prof. Bahr with Dr. Wirz-Ridolfi for the European Academy for Traditional Chinese Medicine (EATCM) signed a contract for an academic exchange and to promote communication and cooperation between BUCM and EATCM. Later Prof. Bahr, president of the EATCM and Dr. Wirz-Ridolfi, lecturer of the EATCM, were invited to attend the 30th anniversary conference of the School of Acupuncture-Moxibustion and Tuina, at BUCM from November 10 to 12th, 2012 in Beijing to give an introduction to European ear acupuncture in order to promote the development of international standardization of AAPs. Since then communication in the field of auricular acupuncture between Chinese and

European scholars has broadened and deepened. From the perspective of developing a widely acknowledged international standards of AAPs, experts need to find common points from different countries or regions. Therefore, the similarities between the Chinese and European systems of auricular acupuncture should first be documented in detail to prepare for follow-up conferences of international standard of AAPs.

2. Methods

2.1. Literature source

The latest published international standard of AAPs [23] and three books about European Auriculotherapy were referenced, including the Chinese [24], English [25] and German [26] versions of *Ear Acupuncture: A Precise Pocket Atlas Based on the Works of Nogier/Bahr*.

2.2. Analysis

The first author was sent to study the theory and clinical practice of European ear acupuncture according to Nogier/Bahr with Dr. Wirz-Ridolfi, at the Medi-China Center for TCM, Reinach, Switzerland. Based on the knowledge of the Chinese and European systems of ear acupuncture, similarities can be found through analysis of nomenclature and location of AAPs.

2.3. The basic auricular anatomy

The anterior and posterior anatomy of the auricle is displayed in Figs. 3 and 4.

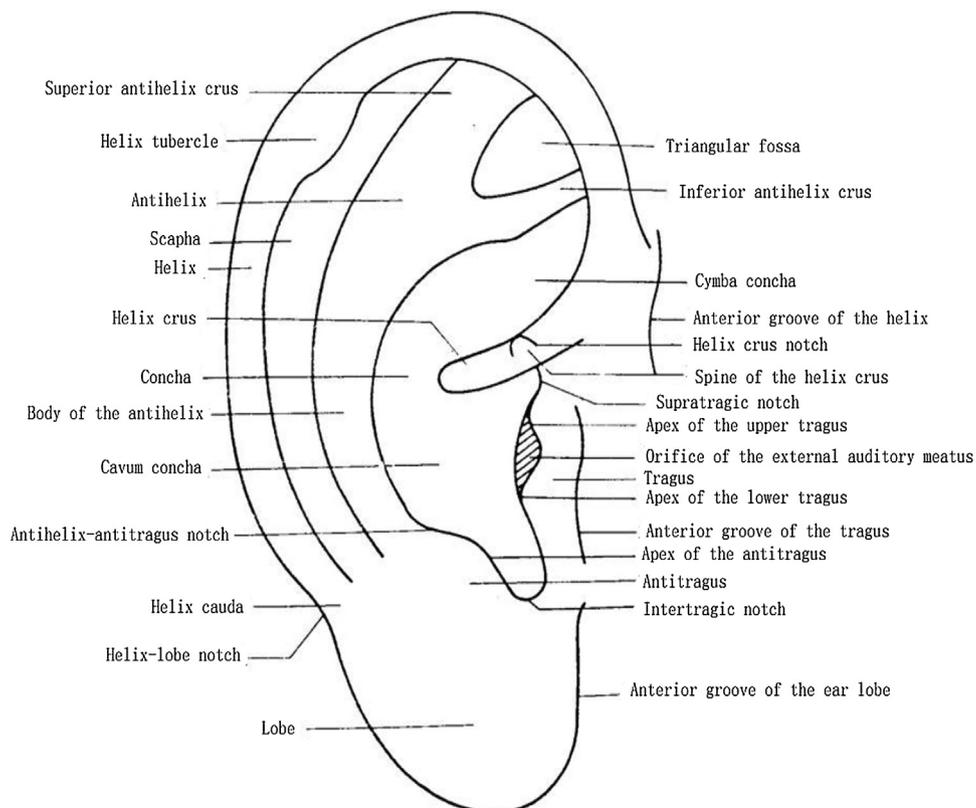


Fig. 3. The anterior auricular anatomy.

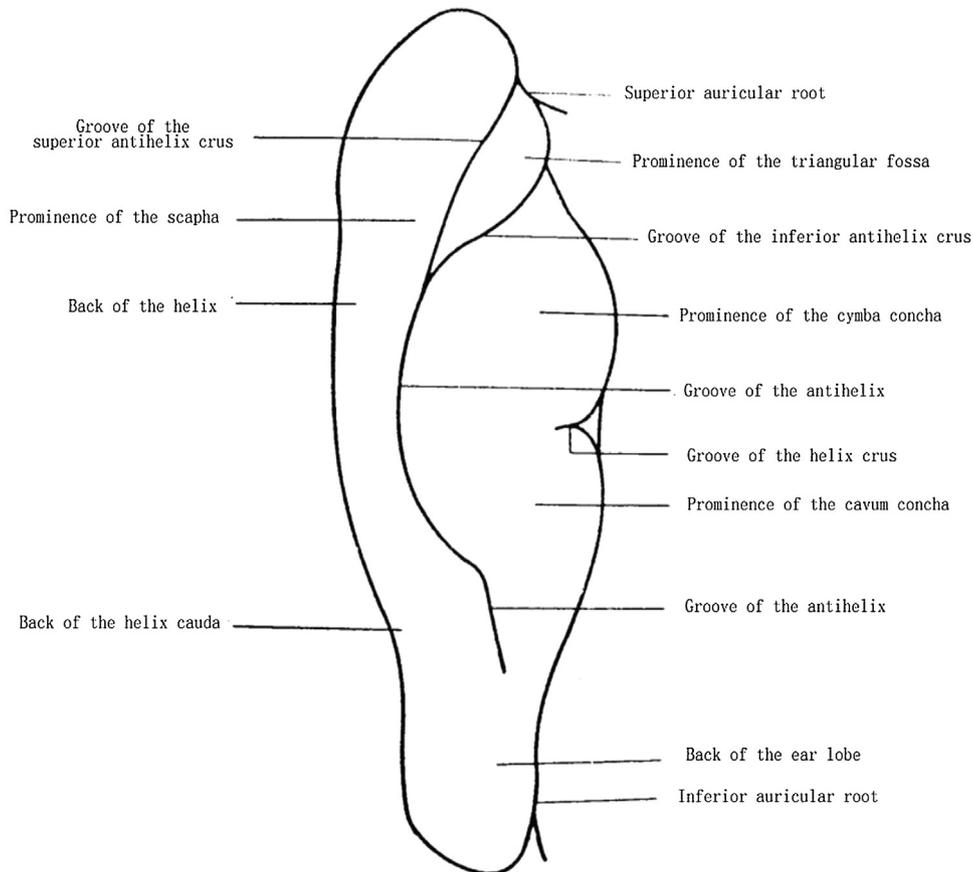


Fig. 4. The posterior auricular anatomy.

Table 2
The location of the locomotor system.

	WFAS standards	European auriculotherapy system
Shoulder	Shoulder (SF _{4,5}) is located in the area inferior to SF ₃ (Fig. 5).	The shoulder joint and its adjacent structures (clavicle, scapula) project, as may be expected, approximately at the level of European Point C ₇ /T ₁ , where there is a distinct change of the curvature of the antihelix, the sharp edge widens and becomes gently rounded onto the scapha (Fig. 6).
Wrist	Wrist (SF ₂) is located in the area inferior to SF ₁ (Fig. 5).	The wrist projects onto a relatively large area, lateral to European knee joint point, which is located similar to TF ₃ in the deepest point of the triangular fossa (Fig. 6).
Elbow	Elbow (SF ₃) is located in the area inferior to SF ₂ (Fig. 5).	The elbow joint point is located lower third between shoulder joint point and wrist zone (Fig. 6).
Finger	Finger (SF ₁) is located in the superior scapha (Fig. 5).	The metacarpal bones and the fingers project onto the area between the wrist zone and the helix (Fig. 6).
Pelvis	Pelvis (TF ₅) is located in the lower part of the posterior third of the triangular fossa (Fig. 5).	The pelvis area includes the reflex points of the hip joint, the pubic bone, the sacroiliac joint and the points of the iliac crest (Figs. 6 and 7).
Buttock	Buttock (AH ₇) is located on the posterior third of the inferior antihelix crus (Fig. 5).	The sacroiliac joint is located in the posterior area of the inferior antihelix crus (Figs. 6 and 7).

2.4. The rationale of the selection of the AAPs

The points of the two systems with similar locations were selected and described.

3. Results

3.1. Mapping of the locomotor system

The upper limb projects onto the scapha. The pelvis projects into the acute angle of the triangular fossa where the superior and

inferior antihelical crura meet. The location of shoulder, wrist, elbow, finger, pelvis and buttock are located similarly between the WFAS standard and European auriculotherapy system. See Table 2.

3.2. Mapping of the gastrointestinal system

There are different ways to describe the mapping of the gastrointestinal system on the ear. According to Chinese acupuncture book, points related to the digestive tract are distributed around the helix crus. According to European Ear acupuncture, the organs of the gastrointestinal system project onto the entire

Table 3
The location of the gastrointestinal system.

	WFAS standards	European auriculotherapy system
stomach	Stomach (CO ₄) is located at the end of helix crus (Fig. 5).	The stomach zone forms a crescent-shaped area around the root of the helix (Fig. 8).
esophagus	Esophagus (CO ₂) is located in the concha inferior to the intermediate 1/3 of the helix crus (Fig. 5).	The mapping of esophagus is located at the medial end of the stomach zone below the root of the helix (Fig. 8).
duodenum	Duodenum (CO ₅) is located in the posterior 1/3 of the region between the helix crus and Line AB (Fig. 5).	The duodenum zone is located in the superior concha adjacent to the reflex area of the stomach, superomedial to the root of the helix (Fig. 8).
small intestine	Small intestine (CO ₆) is located at the intermediate 1/3 of the region between the helix crus and Line AB (Fig. 5).	The small intestine is located in the upper and middle region of the superior concha, occupying the larger part of the superior concha (Fig. 8).
large intestine	Large intestine (CO ₇) is located at the anterior 1/3 of the region between the helix crus and Line AB (Fig. 5).	Large intestine is located in the upper part of the superior concha (Fig. 8).
appendix	Appendix (CO _{6,7i}) is located at the junction of CO ₆ (small intestine) and CO ₇ (large intestine) (Fig. 5).	Appendix is located underneath the root of helix in the corner formed by the helix crus against the concha, at the medial border of the superior concha (Fig. 9).
liver	Liver (CO ₁₂) is located in the posteroinferior part of the cymba conchae (Fig. 5).	Liver is located on the right ear in the mediolateral portion of the concha, and a very small zone is also present on the left ear (Fig. 8).
gallbladder and pancreas	Gallbladder and pancreas (CO ₁₁) are located in the posterosuperior part of the cymba conchae (Fig. 5).	The gallbladder is located in the middle third of the superior concha. And the reflex area of the parenchymal pancreas (digestive enzymes) (Fig. 10) is located medially to the gallbladder point in the superior concha. The reflex area of the endocrine pancreas (insulin production) (Fig. 10) is located in the antihelical wall at the transition from the upper third to the middle third of the wall.

Table 4
The location of the urogenital system.

	WFAS standard	European auriculotherapy system
bladder and ureter	Bladder (CO ₉) is located in the cymba conchae below the intermediate region of the inferior antihelix crus, and ureter (CO _{9,10i}) (Fig. 5) is located at the junction of CO ₉ and CO ₁₀ . The ureter is bordering laterally on the urinary bladder points (Fig. 11).	The ureter is bordering medially on the urinary bladder point.
CO ₈ and prostate	CO ₈ (angle of superior concha) is located in the cymba conchae below the anterior region of the inferior antihelix crus (Fig. 5).	The prostate is located on the inside of the ascending helix where the antihelix meets the ascending helix, about 2 millimeters away from the helical rim (Fig. 11).
urethra	The mapping of urethra is located at the anterior edge of the ascending helix. According to WFAS standard, urethra (HX ₃) is located on the helix superior to HX ₂ (Fig. 5).	The main portion of the urethra projects at the anterior edge of the ascending helix where the cartilaginous border is palpable under the skin, and this point connects with the urinary bladder point underneath the ascending helix in the superior concha (Fig. 11).

superior concha and the upper part of the inferior concha. However, the location for the stomach, esophagus, duodenum, small intestine, large intestine and appendix are all located around the helix crus in the concha. The location of liver, gallbladder and pancreas are all located in the concha. See Table 3.

3.3. Mapping of the urogenital system

The mapping of the urogenital system is similar between most organs of the WFAS standard and European Ear acupuncture, including ureter, urinary bladder, prostate and urethra.

The mapping of ureter and urinary bladder are both located in the upper region of the superior concha adjacent to antihelical wall. However, the relationship of the positions of urinary bladder and ureter differs. See Table 4.

The reason CO₈ is called angle of superior concha is that names referring to gender were not included, instead, this point is named for the anatomical features of the auricle. According to the Chinese 2008 standards, this sub-area refers to the prostate for men, and the interior part of urethra in women.

Table 5
The location of the head.

	WFAS standard	European auriculotherapy
eye	Eye (LO ₅) is located in the center of the anterolateral surface of the lobe (Fig. 5).	Eye is located in the center of the lobule where many people wear an earring (Fig. 12).

Table 6

The location of the nervous system.

	WFAS standard	European auriculotherapy system
Temple	Temple (AT ₂) is located at the middle part of the lateral side of the antitragus (Fig. 5).	The temporal lobe is located on the ear lobe and lower edge of the antitragus (Fig. 13).
Occiput	Occiput (AT ₃) is located at the posterior part of the lateral side of the antitragus (Fig. 5).	The occiput lobe is located on the outer surface of the antitragus, also on the back of the ear in the corresponding area (Fig. 13).
Subcortex	Subcortex (AT ₄) is located on the medial side of the antitragus (Fig. 18).	Thalamus (Fig. 14) is located on the inside of the antitragus where the inferior concha merges with the ascending wall of the antitragus. And hypothalamus (Fig. 15) is located superior and lateral to the thalamus point, in the wall ascending from the inferior concha to the antitragus.
Endocrine	Endocrine (CO ₁₈) is inside of the intertragic notch in the anteroinferior region of the cavum conchae (Fig. 5).	The adenohypophysis (anterior pituitary gland) (Fig. 16) projects onto a relatively large area in and around the intertragic notch. The neurohypophysis (posterior pituitary gland) (Fig. 16) projects lateral to the anterior part of the antitragus. ACTH (adrenocorticotropic hormone) point (Fig. 15) is located in the anterior corner of the intertragic notch where the notch ascends to the tragus. Prolactin point (Fig. 17) is located just above the ACTH point. TSH (thyroid-stimulating hormone) point (Fig. 17) is located just behind the ACTH point in posterior direction toward the antitragus. Gonadotropin point (FSH [follicle-stimulating hormone] point/LH [luteinizing hormone] point) (Fig. 17) is located on the anterior outer bulge of the antitragus, about 2 millimeters inferior to the upper reflection. Oxytocin point (Fig. 17) is located on the antitragus, posterior to the gonadotropin point.

3.4. Mapping of the head

The reflex zones of the head project onto the lobule and the end of helical groove. However, only one point is similar between organs on the head of the WFAS standard and European ear acupuncture. It is the eye point. See Table 5.

3.5. Mapping of the nervous system

The subcortex is located below the cerebral cortex and completely covered by it. It can be divided into three general areas: (1) Brainstem or hindbrain; (2) midbrain; and (3) forebrain, including thalamus and hypothalamus. See Table 6.

3.6. Other twenty-five sub-areas or points

Four sub-areas (HX₉, HX₁₀, HX₁₁ and HX₁₂) in the helix: According to the WFAS standards, the region from the lower edge of the helix tubercle to the notch of the helix lobe is equally divided into four sub-areas, HX₉, HX₁₀, HX₁₁ and HX₁₂ (Fig. 5). According to European ear acupuncture, the spinal cord (Fig. 19) is located on the descending helix, starting below Darwin's Point, ending approximately at the level of the postantitragal fossa.

Among the ninety-three ISAAPs developed by WFAS, twenty-one (22.6%) were based on the anatomical terminology of the surface of the auricle, including (1) ear center (HX₁), (2) anterior ear apex (HX₆), (3) ear apex (*), (4) posterior ear apex (HX₇), (5) node (HX₈), (6) superior triangular fossa (TF₁), (7) middle triangular fossa (TF₃), (8) upper tragus (TG₁), (9) lower tragus (TG₂), (10) apex of tragus (*), (11) anterior intertragic notch (Fig. 5), (12) posterior intertragic notch (*), (13) apex of antitragus (*), (14) central rim (*), (15) angle of superior concha (*), (16) center of superior concha (*), (17) anterior ear lobe (LO₄), (18) upper ear root (R₁) (Fig. 20), (19) root of ear vagus (R2)

(Fig. 20), (20) lower ear root (R3) (Fig. 20), and (21) groove of posteromedial surface (P₅) (Fig. 20). These points/sub-areas could be listed as internationally acknowledged points. (* indicates Fig. 5)

4. Discussion

4.1. Intercommunication of Chinese and European systems of ear acupuncture

Since Dr. Paul Nogier's theory of the inverted fetus was introduced to China in 1958, a large number of research studies on AAPs have been performed. In 1992, China published the national standards of nomenclature and location of AAPs [27] in order to share scientific research and promote communication. After 16 years, based on both national and international research of AAPs, a new national standard [28] was published by China Standard Press in 2008. In 2013, auricular acupuncture point (WFAS STANDARD-002: 2012) [23] was published in the World Journal of Acupuncture-Moxibustion (WJAM). Academic communication between BUCM and EATCM has been ongoing since 2009.

On the initiative of Dr. Wirz the auricular chart of 1974 was translated into English and Chinese (Fig. 21), which he introduced to China in 2012. The new chart with Bahr's special points and the meridians on the ear was introduced in 2013. At Dr. Wirz's proposal the ear atlas according to Nogier/Bahr by Beate Strittmatter was translated into Chinese in 2014 [24] and presented at BUCM to facilitate for a better understanding by Eastern acupuncturists. Deeper knowledge of the two systems allows for the possibility of discovering more similarities between the WFAS standard and European auriculotherapy according to Nogier and Bahr.

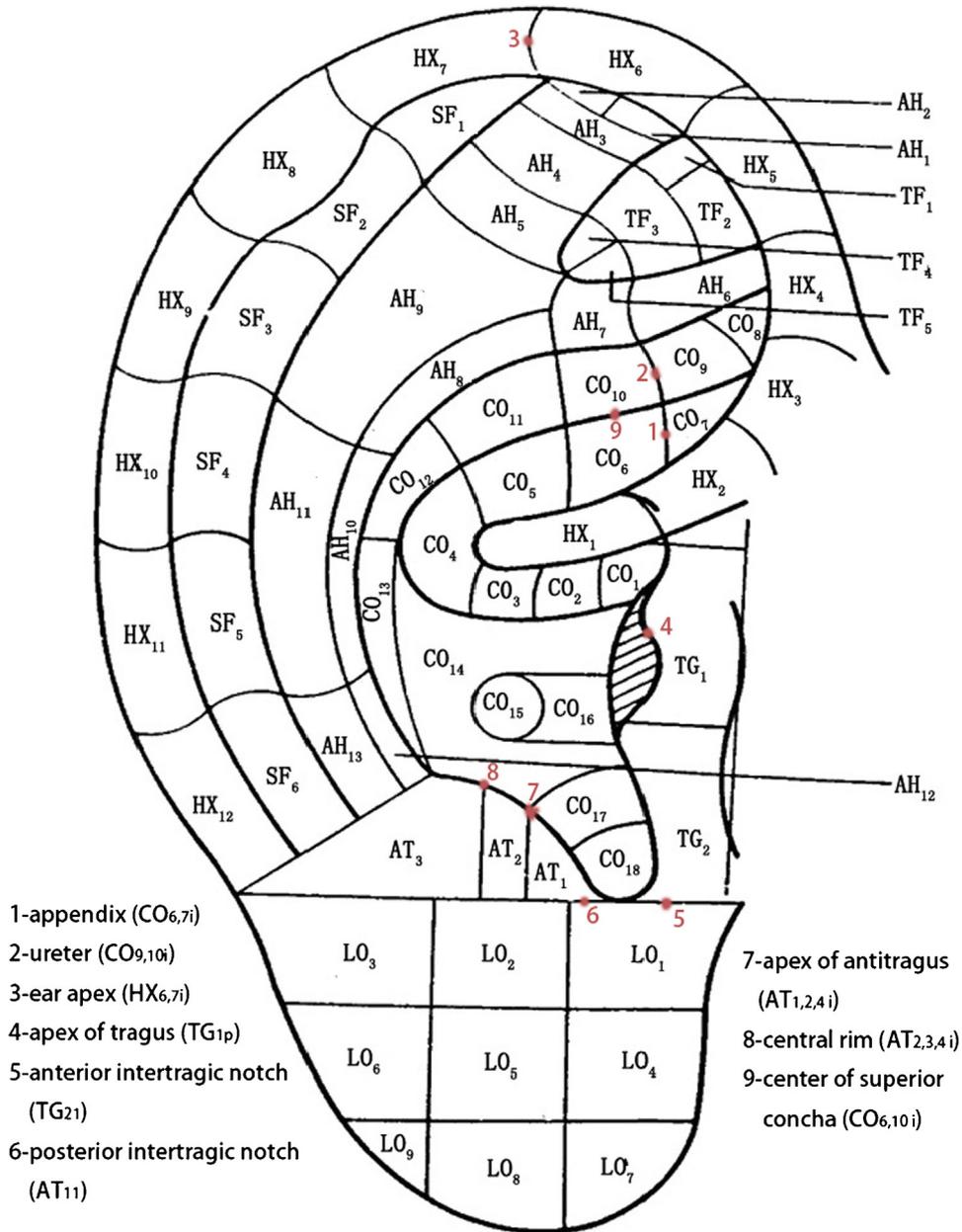


Fig. 5. The auricular sub-zones and 9 marked points published by the World Federation of Acupuncture-Moxibustion Societies.

Note: shoulder-SF_{4,5}(SF₄ and SF₅), finger-SF₁; wrist-SF₂; elbow-SF₃, TF₅-pelvis, AH₇-buttock, stomach-CO₄, oesophagus-CO₂, duodenum-CO₅, small intestine-CO₆; large intestine -CO₇, liver- CO₁₂, gallbladder and pancreas-CO₁₁, bladder-CO₉, angle of superior concha-CO₈, urethra-HX₃, eye-LO₅, temple-AT₂, occiput-AT₃, endocrine-CO₁₈, helix 1-HX₉, helix 2-HX₁₀, helix 3-HX₁₁, helix 4-HX₁₂, ear center-HX₁, anterior ear lobe-LO₄.

4.2. Other twenty-five sub-areas or points

Four sub-areas (HX₉, HX₁₀, HX₁₁ and HX₁₂) in the helix: According to the WFAS standards, the region from the lower edge of the helix tubercle to the notch of the helix lobe is equally divided into HX₉, HX₁₀, HX₁₁ and HX₁₂ (Fig. 5). Helix 1 (HX₉) is located on the inferior border of the helix. Helix 2 (HX₁₀) is located on the helix inferior to HX₉. Helix 3 (HX₁₁) is located on the helix inferior to HX₁₀. Helix 4 (HX₁₂) is located on the helix inferior to HX₁₁.

According to European ear acupuncture, spinal cord is located on the descending helix, starting below Darwin’s Point, ending approximately at the level of the postantitragal fossa.

Among the ninety-three ISAAPs developed by WFAS, twenty-one (22.6%) were based on the anatomical terminology of the surface of the auricle. The following five sub-areas or points can be explained as both Chinese nomenclature and the functional points in European Auricular points according to Nogier/Bahr.

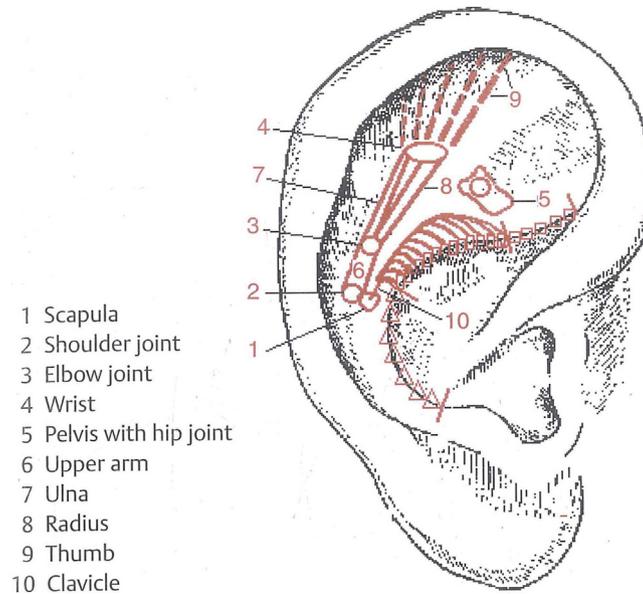


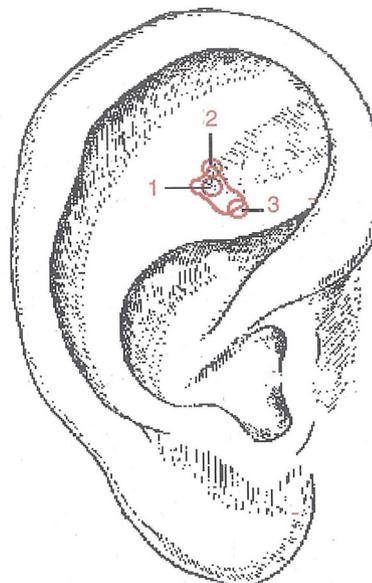
Fig. 6. Upper limb according to Nogier and Bahr.

Ear center: According to the WFAS standard, ear center (HX₁) (Fig. 5) is located on the helix crus. According to European ear acupuncture, Point Zero (Fig. 22) is located on the root of helix, in a cartilage depression that can be clearly palpated with the stirrup-shaped ear probe.

Ear apex: According to the WFAS standard, ear apex (HX_{6,7i}) is the apex formed when the auricle is folded anteriorly at the junction of HX₆ (anterior ear apex) and HX₇ (posterior ear apex). According to European ear acupuncture, histamine point (Fig. 23) is located at the most superior point of the ear (apex of the helix).

Anterior ear lobe: According to the WFAS standard, anterior ear lobe (LO₄) (Fig. 5) is located in the anterior intermediate area of the anterolateral surface of the lobe. According to European ear acupuncture, anxiety point (Fig. 24) is located on the lobule where the ear lobe attached to the facial skin, and worry point (Fig. 25) is located similarly to anxiety point.

Anterior intertragic notch: According to the WFAS standard, anterior intertragic notch (TG₂₁) is located at the lowest part of the front surface of the intertragic notch on the inferior edge of lower tragus (TG₂). According to Chinese nomenclature, it refers to eye Point One. According to European ear acupuncture, pineal gland



- 1 Hip joint
- 2 Pubic bone, symphysis
- 3 Sacroiliac joint

Fig. 7. Pelvis according to Nogier and Bahr.

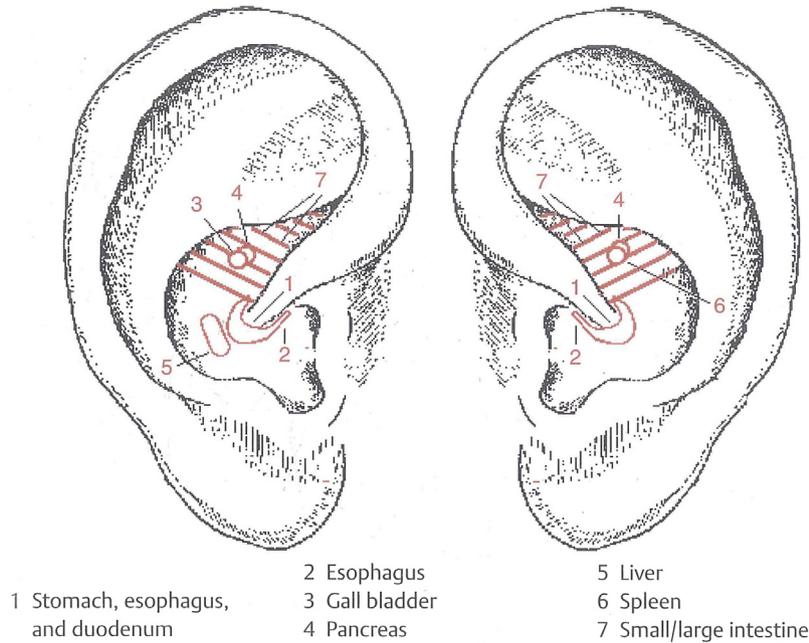
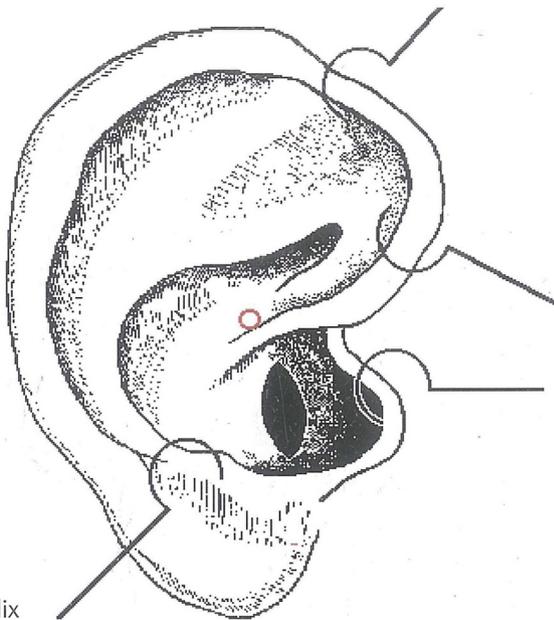


Fig. 8. Mapping of the gastrointestinal system according to Nogier and Bahr.

(Fig. 26) is the mirror image to the aggression point but anterior to the intertragic notch.

Posterior intertragic notch: According to the WFAS standard, posterior intertragic notch (AT_{11}) is located at the antero-inferior part of the antitragus, posterior to intertragic notch and lower edge of AT_1 . According to Chinese nomenclature, it refers to eye Point Two. According to European ear acupuncture, aggression point (Fig. 26) is located below the intertragic notch, about two millimeters from the notch.



Appendix

Fig. 9. Mapping of the appendix according to Nogier and Bahr.

4.3. More similarities of Nogier's points in 1957, fewer similarities of Nogier/Bahr's points in 2001 and later years

In 1957, Paul Nogier proposed an auricular points and inverted-fetus distribution auricular map. Among the ninety-three ISAAPs developed by WFAS, thirty-four (36.6%) sub-zones were based on the nomenclature and locations of Nogier in 1957, including rectum, urethra, external genitals, finger, wrist, shoulder, clavicle, heel, hip, sciatic nerve, sympathetic nerve, buttock, lumbosacral vertebrae, chest, thoracic vertebrae, neck, cervical vertebrae, adrenal gland, forehead, occiput, subcortex, esophagus, cardia, stomach, small intestine, large intestine, bladder, pancreas and gall bladder, liver, spleen, heart, lung, endocrine, and eye [14]. And one subzone, elbow, was not included by mistake. Therefore, among the ninety-three ISAAPs, thirty-five (37.6%) sub-zones were based on the nomenclatures and locations of Nogier in 1957. Through comparison of the ninety-three ISAAPs developed by WFAS and the European Auricular points according to Nogier/Bahr in 2001 and later times, the number of points with similarity reduces from thirty-five to twenty-four, including shoulder, wrist, elbow, finger, pelvis and buttock, stomach, esophagus, duodenum, small intestine, large intestine, appendix, liver, gallbladder and pancreas, ureter, urinary bladder, prostate, urethra, eye point, temple, occiput, sub-cortex and endocrine. Compared with the ninety-three ISAAPs developed by WFAS, there are more similarities with Nogier's points in 1957, fewer similarities with Nogier/Bahr's points in 2001 and later years. This is due to the history and development of European auriculotherapy. Based upon his experience with acupuncture, Paul Nogier began to take his patients' pulse while examining their ears. He discovered variations of pulse when he touched different zones of the ear. This was the beginning of European auricular acupuncture or auriculotherapy, which later developed into auriculomedicine. Now it is clear that this variation of pulse, or vascular autonomic signal (VAS), is a reaction of the autonomic nerve system (sympathetic and parasympathetic). This modification of the pulse

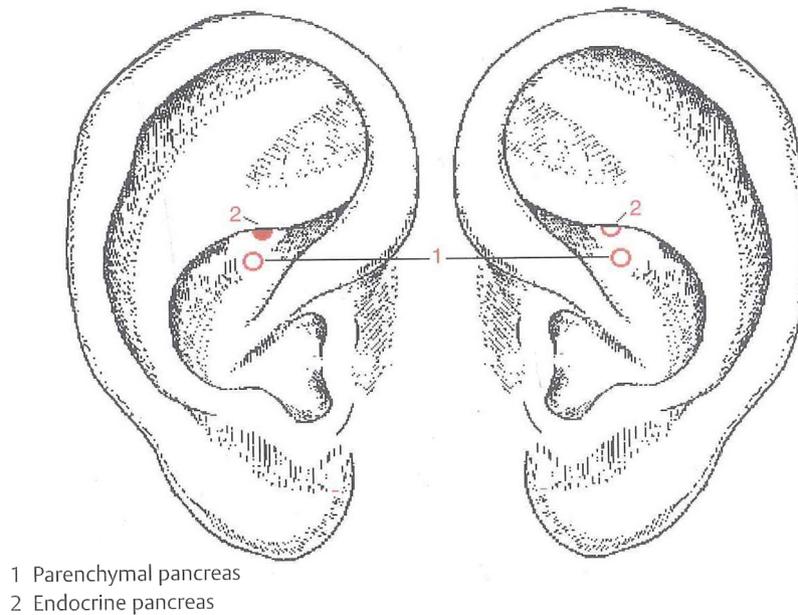


Fig. 10. Mapping of the pancreas according to Nogier and Bahr.

called VAS is mediated by the unconscious autonomic nervous system and is a neurological reflex. The more recent European auricular maps were mostly produced with the help of the VAS. The third pillar of European Ear Acupuncture is the phenomenon of the foci. Prof. Bahr and Dr. Strittmatter elaborated the Focus theory [29]. A focus is a harmful influence that interferes with the body's system of self-regulation, especially controlling stimuli that disturb the body's order. It is also an obstacle to diagnosis and treatment [30].

4.4. Auricular sub-zones

Of the ninety-three ISAAPs developed by WFAS, AAPs were extensively named with English abbreviations and numbers. Seventeen (18.28%) AAPs were named for the point rather than the zone (Table 7). The remaining seventy-six (81.72%) were based on the zone nomenclature system put forth by Oleson [31] (Fig. 27).

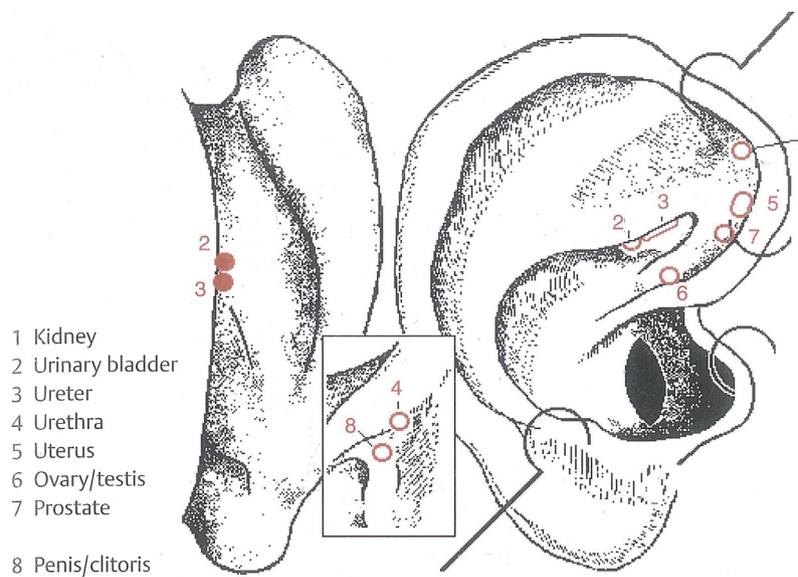


Fig. 11. Mapping of the urogenital system according to Nogier and Bahr.

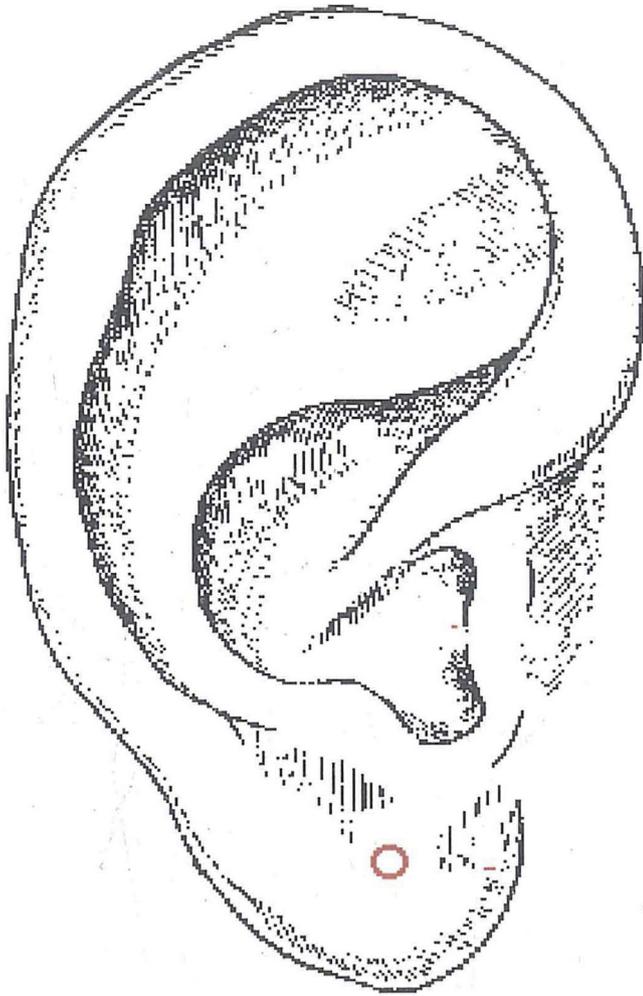
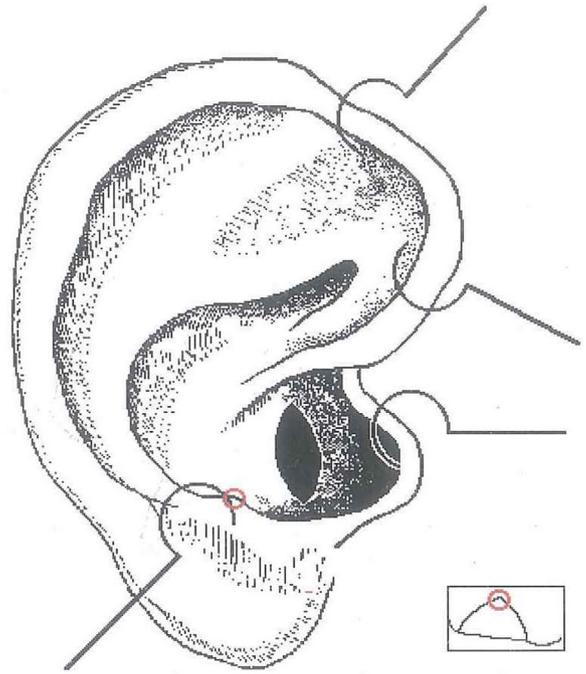


Fig. 12. Mapping of the eye according to Nogier and Bahr.



Thalamus

Fig. 14. Mapping of the thalamus according to Nogier and Bahr.

4.5. Limitations

The WFAS standards of AAPs was mainly based on the Chinese 2008 standard, Auricular Nomenclature and Location. The Chinese 2008 standard is a hybrid of Nogier’s (French) academic contributions, Chinese academic consensus and Oleson’s (American) nomenclature systems. The WFAS standard was also approved by the working group of the international standardization which

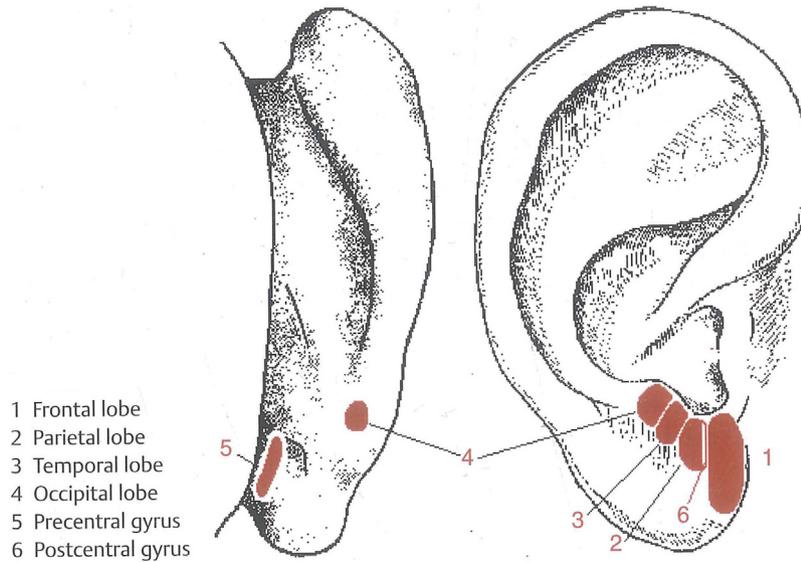
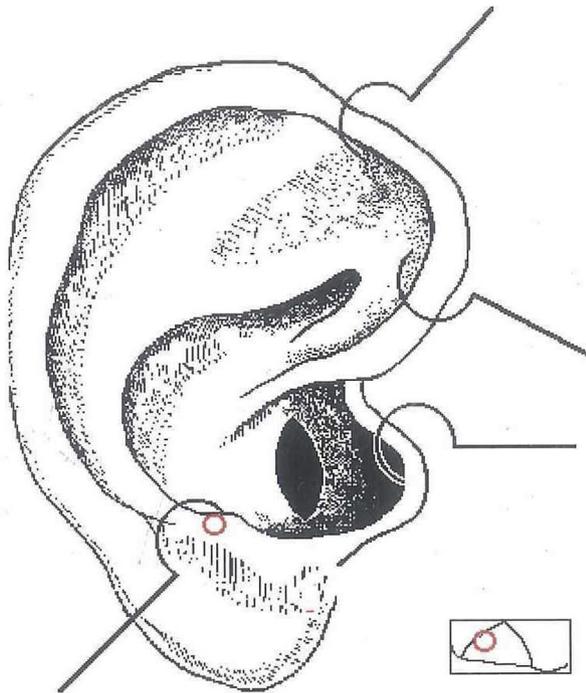
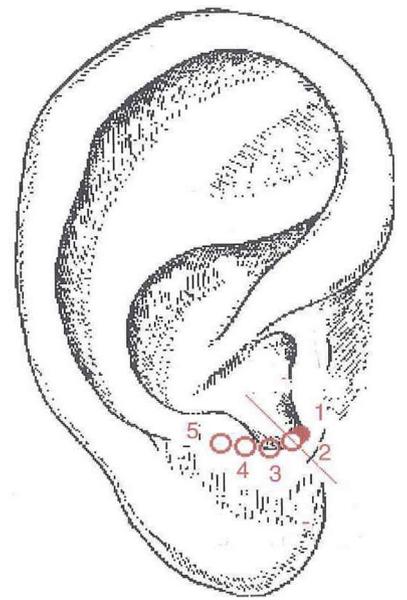


Fig. 13. Mapping of the cerebral lobes according to Nogier and Bahr.



Hypothalamus

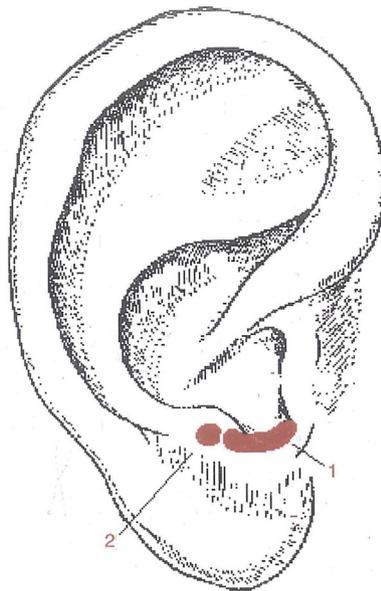
Fig. 15. Mapping of the hypothalamus according to Nogier and Bahr.



- 1 Prolactin Point
- 2 ACTH Point
- 3 TSH Point
- 4 Gonadotropin Point (FSH/LH Point)
- 5 Oxytocin Point

Fig. 17. Mapping of the hormones secreted by the pituitary gland according to Nogier and Bahr.

included experts from China, America, Canada, Iran and South Korea. Since French physicians discovered ear reflex zones in the 1950s, the European system of auriculotherapy points presided



- 1 Adenohypophysis
- 2 Neurohypophysis

Fig. 16. Mapping of the pituitary gland according to Nogier and Bahr.

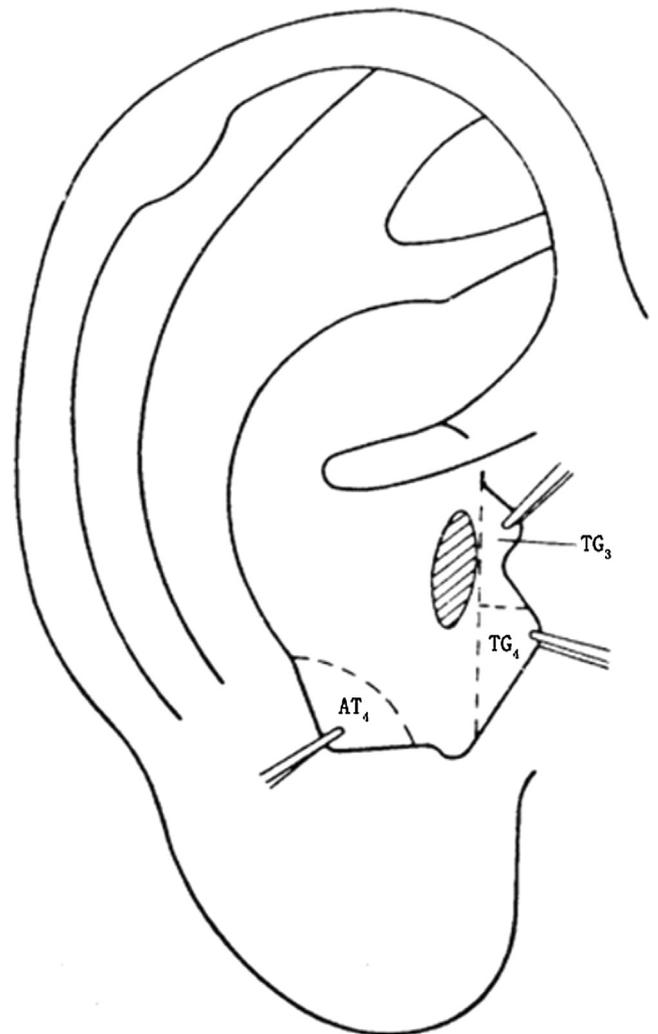
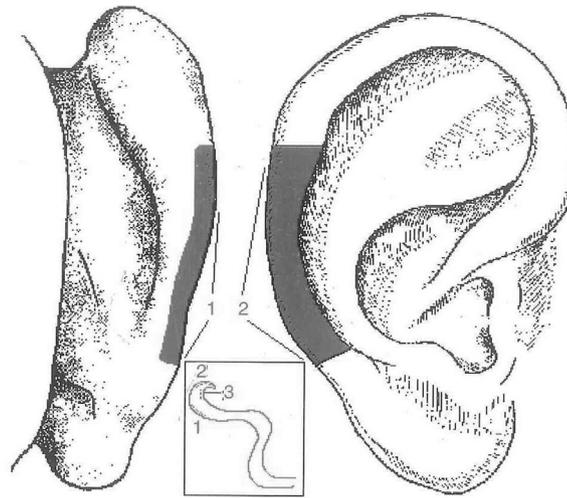


Fig. 18. The subzones of the medial of the anterior auricle, subcortex-AT₄.



- 1 Spinal cord, motor portion
- 2 Spinal cord, sensory portion
- 3 Nuclei of origin of sympathetic/parasympathetic nerves

Fig. 19. Mapping of the spinal cord according to Nogier and Bahr.

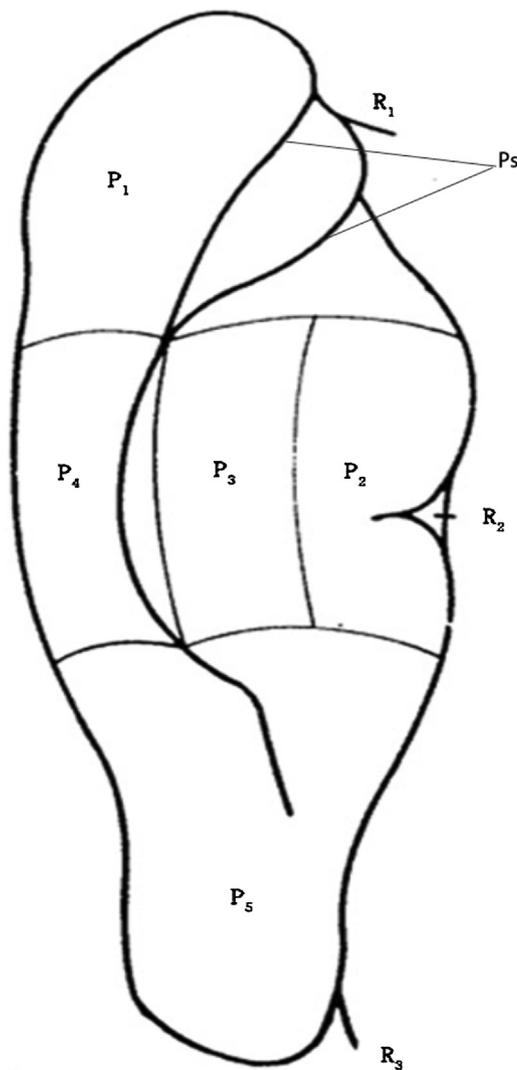


Fig. 20. The posterior subzones in the WFAS standard of AAPs.

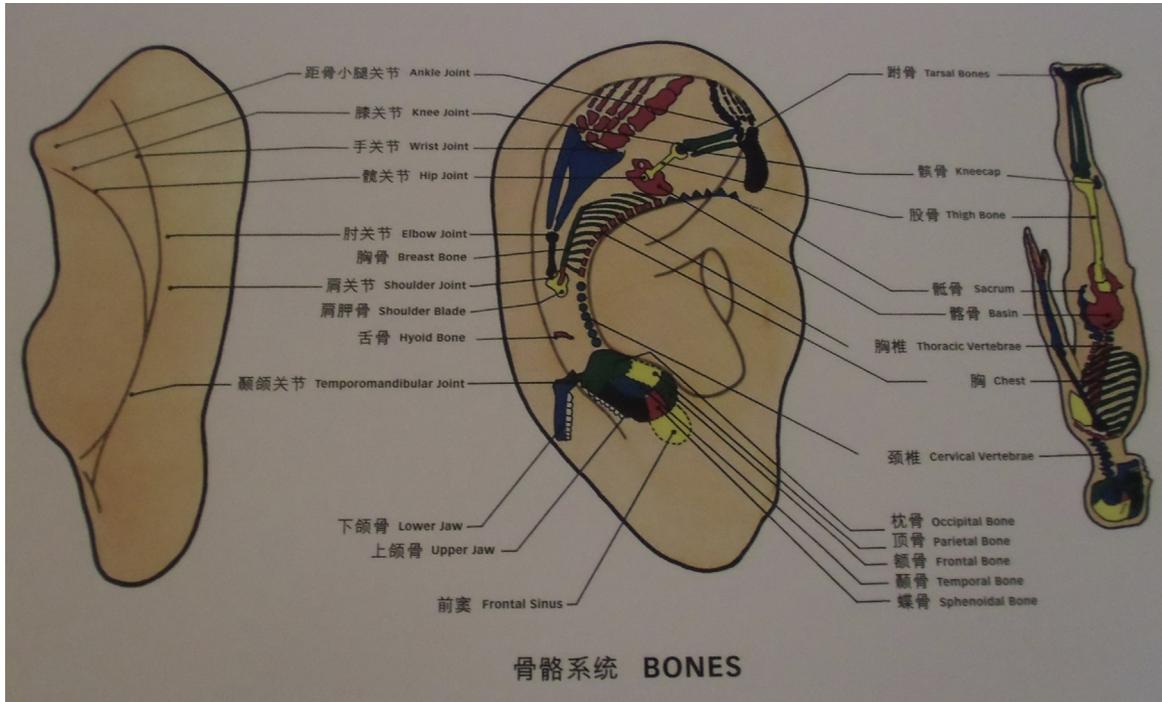


Fig. 21. The English and Chinese version of Prof. Bahr's auricular chart of 1974, initiated by Dr. Wirz.

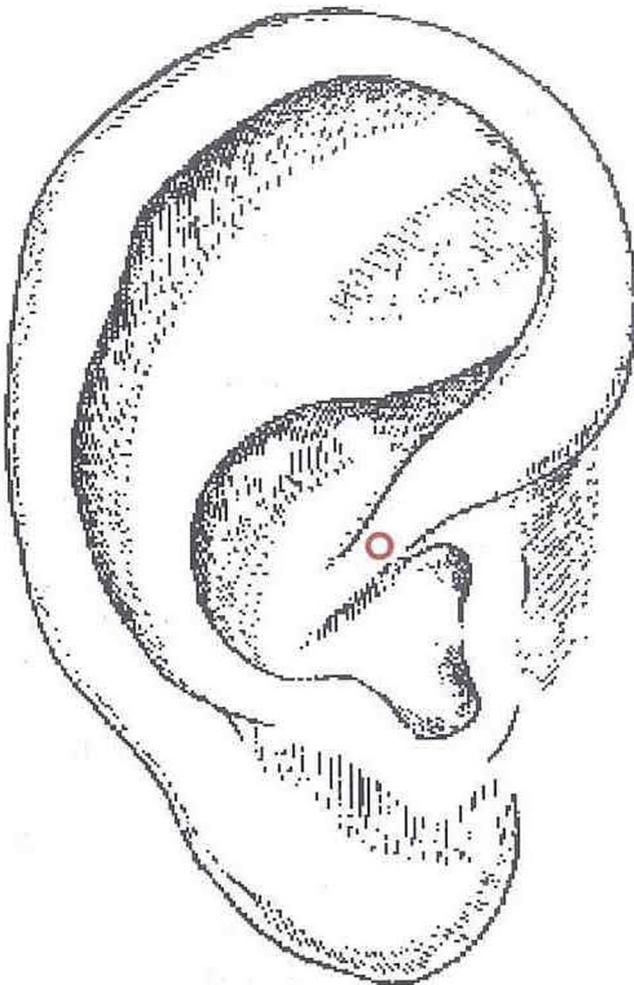


Fig. 22. Point Zero.

over by Bahr, the German school, has grown into a highly specialized method with its own unique set of diagnosis and treatment, and is popular in Germany, Austria, Switzerland and other European countries. The similarities between the WFAS standard of AAPs and the school of European system of auriculotherapy presided over by Bahr are discussed in this paper, which does not include other schools of auriculotherapy. For clinical practice and research of AAPs, and for promoting the ISO's international standardization of AAPs, further studies should be conducted to clarify the disparities of the WFAS standard and European system of auriculotherapy according to Bahr, and to master the similarities and disparities between the WFAS standard of AAPs and Oleson's nomenclature system, and the French school of auriculotherapy.

5. Conclusion

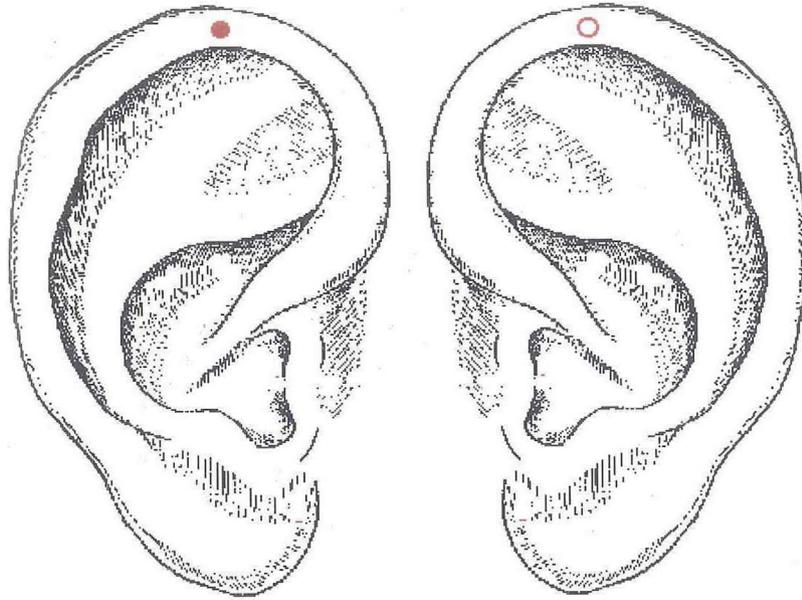
There are twenty-four auricular acupuncture points sharing the same name and similar locations, and an additional twenty-five sub-areas or points which share the auricular anatomical name with different reflexed parts of the body and different therapeutic effects.

Conflict of interest

The authors declare that they have no conflicts of interest.

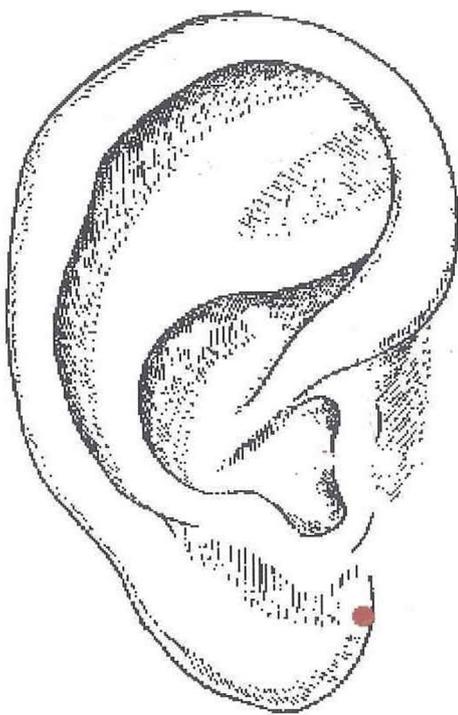
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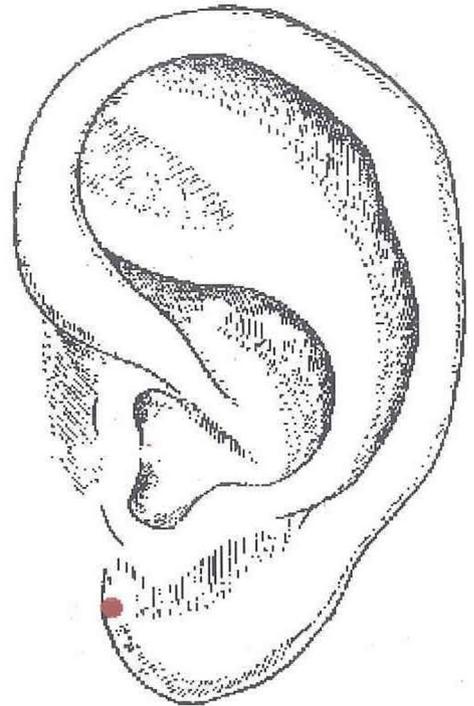
Histamine Point

Fig. 23. Histamine point.



Anxiety Point

Fig. 24. Anxiety point.

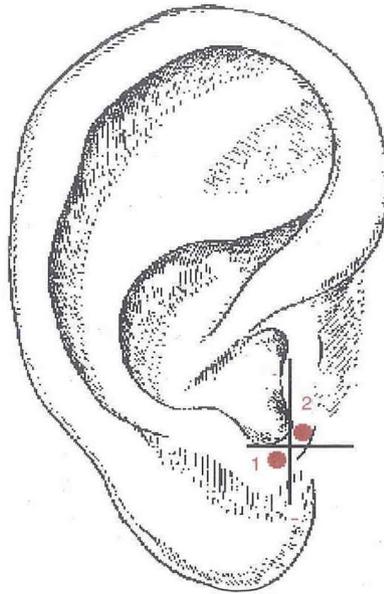


Worry Point

Fig. 25. Worry point.

Chinese Medicine and Auriculomedicine (SACAM). We are also

[14] L. Wang, B.X. Zhao, L.Q. Zhou, Status and strategies analysis on international



- 1 Aggression Point
- 2 Pineal Gland Point

Fig. 26. Aggression point and pineal gland point.

Table 7

Seventeen AAPs named as points in the WFAS standard.

Eighteen Points named for point
(1) ear apex, (2) fengxi-windstream, (3) sympathetic nerve, (4) external ear, (5) apex of tragus, (6) external nose, (7) adrenal glands, (8) a nterior intertragic notch, (9) posterior intertragic notch, (10) apex of antitragus, (11) central rim, (12) brain stem, (13) ureter, (14) cheek, (15) upper ear root, (16) root of ear vagus, and (17) lower ear root

Note: According to the WFAS standard, the shoulder is named for SF_{4,5}. It means SF₄ and SF₅. Therefore, the authors of the article [14] made a mistake. Shoulder should be counted in the category of nomenclature by sub-zones or sub-areas.

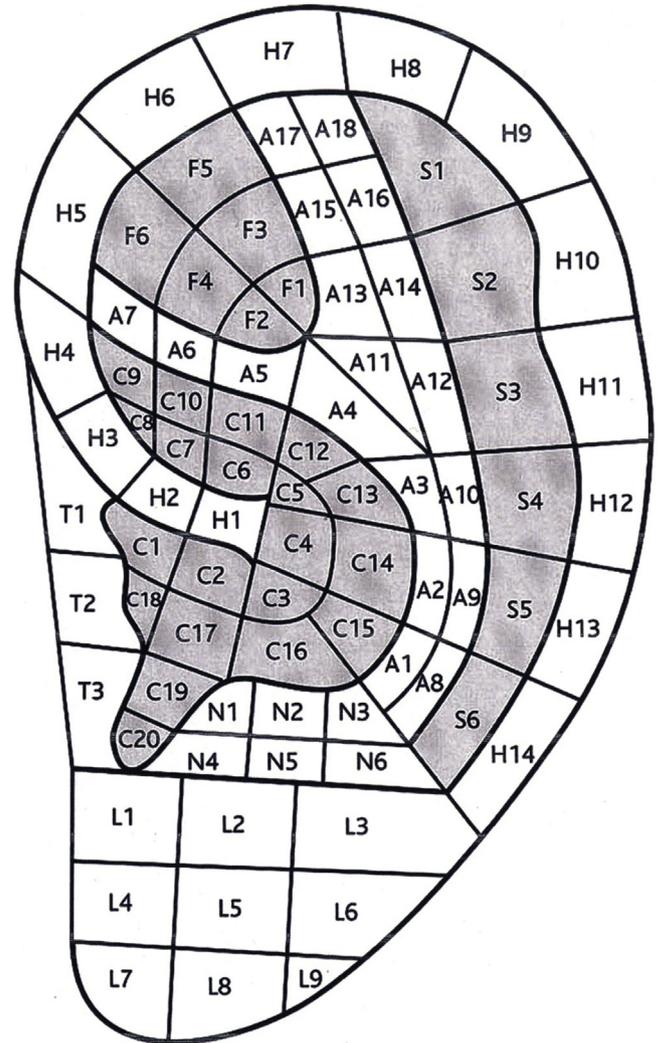


Fig. 27. Oleson's nomenclature system in 1983.

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