

Traian Vuia – the Romanian inventor who first flew a powered airplane in 1906

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Abstract: *As observed the beginning of heavier than air devices started with Wright Brothers who flew in 1903 the first catapulted airplane equipped with an engine, similar to present motor gliders. In March 1906 took place the first flight of Vuia's monoplane using on board installations. Since then a real competition between manufacturers has started to improve their airplanes as they become more efficient. Traian Vuia's first flights and his beginnings are explained below.*

Key Words: *history of aviation, powered aircraft, first flight, Romanian inventor.*

1. INTRODUCTION

During the year 1906 Vuia made three major contributions to the world of aviation. Firstly he flew for the first time a vehicle heavier than air using only his on board installations; secondly his airplane was the first to fly with only one propeller and thirdly his airplane was the first single-plane powered aircraft to fly.

2. TRAIAN VUIA'S FLIGHTS

Traian Vuia was born on August 17, 1872 in a village known as Surducul Mic in the Timis county of Romania. Since childhood he dreamed to be able to fly a machine invented by himself. He studied only technical problems that he was particularly interested in, the problem of flight being for him the most important one. After graduating the high school in Lugoj (Timis county) he could not finish a school of mechanics due to financial problems, and had to attend and graduate a faculty of law which in those times could provide him with financial support.

Vuia accomplished his studies about human flight and designed his first flying machine which he called "the airplane-car". He tried to build this machine in Lugoj but, because he had no material help, he decided to go to Paris. On the first of July 1902 he arrived in Paris. Vuia was hoping that in Paris - considered at that time the centre of the aeronautical world - he would find somebody interested in his project.

Vuia asked Professor Tatin to sustain his project but Tatin, known as a very good theoretician and experimenter argued with Vuia that the flying machine he was proposing did not have a suitable engine (which was accepted by all constructors of flying machines at that time) and that it had only one propeller, while all aero-models which had flown so far had had two parallel propellers rotating in opposite directions (for stability reasons).

However Vuia continued to sustain his project and submitted it to the Science Academy of Paris on February 16, 1903 with the title "Project of an airplane-car".

The special Commission of Aeronautics of the Science Academy of Paris considered Vuia's project a utopia. They rejected it with the comments: 'The problem of flight with a machine which weighs more than air cannot be solved and it is only a dream.'

Vuia did not give up and applied for a licence for his machine from the Office of Industrial Property in France. On August 17, 1903 he received this licence with the registration no. 332-106. It was officially published on October 16, 1903.

This flying machine was called by his constructor 'Traian Vuia 1'. It was a single-plane airplane with a high-wing. The second difficult problem solved by Vuia was the building of an engine which could develop a propulsion force to ensure autonomous take-off.

During the autumn of 1904, he began to build the engine based on carbonic acid as fuel, also an invention of his own. During the same year (1904) Vuia got a license for his invention from Great Britain. It was known that the first airplane engine which appeared in 1903 was built by Wright brothers.

The second one, built by Charles Manly was used by Prof. Langley for his airplane; he tried to fly with it two times in 1903 but he failed. (This engine can be seen in Washington, at "National Air & Space Museum"). The third engine was Vuia's. It was the second engine in the world which worked on a flying machine (Vuia's engine is exposed in Paris, at the "Air Museum"; a copy of it being in Bucharest, at the "Central Military Museum").

The propeller of Vuia's flying machine was built by Tatin, who, seeing that Vuia's airplane was becoming a reality, decided to help him. The propeller was the only part of the airplane built by Tatin.

While he was building his airplane Vuia received some visitors like George Besancon, Santos-Dumont etc., well-known personalities in aviation. Most of them were shocked by the fact that Vuia adopted a mono-plane solution for his airplane, because all airplanes which had flown by then were built after Lilienthal-Chanute double-plane idea. Vuia's argument was that he was inspired by nature (he used to say "I have never seen a bird with more than two wings"). They were also worried because Vuia's machine had only one propeller so airplane's stability was difficult to maintain.

"Vuia 1" airplane was completely built in December 1905. Now Vuia had to choose a suitable place to test his machine; he found a plain called Montesson, near Paris, where he could not be disturbed by spectators. His first experiments began in December 1905. In this period he used his machine only as a car; the wings were not mounted on it.

After he became a very good pilot for his "car" Vuia changed it into what he called the "airplane-car" by adding the wings. In this configuration the machine was still used only as a car, till it could attain safely a speed of 40 km/hour (21kts) without using the engine at its maximum capacity.

By now nobody, except one of the men who had helped him building the machine, attended these experiments. In February, after they heard of Vuia's successes, more people - including George Besancon and others-joined him to see the attempts. During February many papers in France began to devote large spaces to Vuia's machine. Considering the weather warm enough, Vuia decided to make his first flying attempt on March 18, 1906.

He decided to make the attempt in the afternoon, so at three o'clock p.m. he started the engine. Within minutes his machine began to move. After an accelerated motion (about 50 meters) "Vuia 1" left the soil and flew at a height of about 1 m. After about 12 m in flight, some problems occurred with the engine so the propeller stopped and "Vuia 1" landed.

A second flight experiment was done on the 6th of May 1906. Vuia was making experiments with various angles of incidence when the left wing bent almost vertical. Similar flight experiments took place also on the 24th of June, 1st of July.

All these experiments and concerns over the results were communicated in his letter dated 8th of July 1906 to the “L’Aerophile” (Commission for Aeronautics) of the Science Academy of Paris.

Other improvements were done to his airplane due to further flight experiences on 12th and 19th of August 1906. They were due to a new engine installed using the same principle with an increase in thrust and rpm. A rear horizontal stabilizer was added to the airplane. On the 19th of August Vuia flew at the height of about 2.5 metres for about 24 metres after which the machine hit the ground damaging the propeller, a wheel and a shock absorber, which would delay his attempts for improving his airplane. The test flight results were also communicated in his letter dated 25th of August 1906 to the French Academy of Science.

Six months after Vuia’s first flight another pioneer of aviation - Santos-Dumont succeeded in a similar attempt; he is sometimes quoted as the first who flew using only his on board installations, because his flight was officially controlled. But Vuia had flown many times before: March 18, June 24 at Issy-les-Moulineaux (also in France), July 1, July 5, July 14, August 12, August 19, etc.



The main characteristics of Vuia's first airplane:

- span : 8.70 m (28.7 ft)
- length : 5.65 m (18.6 ft)
- height : 2.90 m (9.5 ft)
- lifting surface : 20 sq.m (217 sq.ft)

engine (using carbonic acid as fuel) : 20 HP at 450 rpm
thrust at fixed point : 45 kgf (99.2 lbf)
total weight : 195kg (430 lb) + Vuia's 56kg (124 lb) = 251kg (554 lb)

In 1907 Vuia flew many times. A notable event took place on March 27 when Vuia, Santos-Dumont and Bleriot attended an aviation meeting at Bagatelle (near Paris). It was Vuia who succeeded alone in his attempt due to his technical improvements, while Santos-Dumont and Bleriot were not able even to take off. Santos Dumont made only three flights during 1906 in his first biplane built by him (named no 14 bis, as it followed his previous attempt with a balloon named no.14). His first flight was on September 13, 1906 and was officially controlled, then October 23, and November 12, 1906.

The following year Santos-Dumont gave-up his first airplane and built a new one, completely different. In 1907 the number of autonomous flying machines increased rapidly; Charles Voisin on March 16 and 30, Louis Bleriot on July 11, 25 etc., Henri Farman on September 30, Esnault-Pelterie in October etc.

The first aerial trip was made by Henri Farman on October 30, 1908, from Bouy to Reims (about 30 Km). The first aerial raid (Tourey-Artenay-Tourey, around 100 Km) was made by Bleriot on October 31, 1908. During 1908 Wilbur Wright, came to France and established a lot of records with his machine. It should be noted that all these pioneers flew double-plane airplanes.

Only Bleriot, after some unsuccessful attempts, reached the idea of Vuia (the single-plane) in 1907. After "Vuia 1", Traian Vuia built "Vuia 1 bis" which was equipped with the same engine but was enhanced by his constructor, and "Vuia 2" which was equipped with a new engine built by the French engineer Leon Levavasseur. Vuia also built two helicopters in 1918 and 1922.



Traian Vuia's monoplaner today

REFERENCES

[1] Wikipedia 2011, Traian Vuia

[2] Traian Vuia, letters to French Academy of Science – Paris, dated 8-th of July 1906 and 25-th of August 1906.